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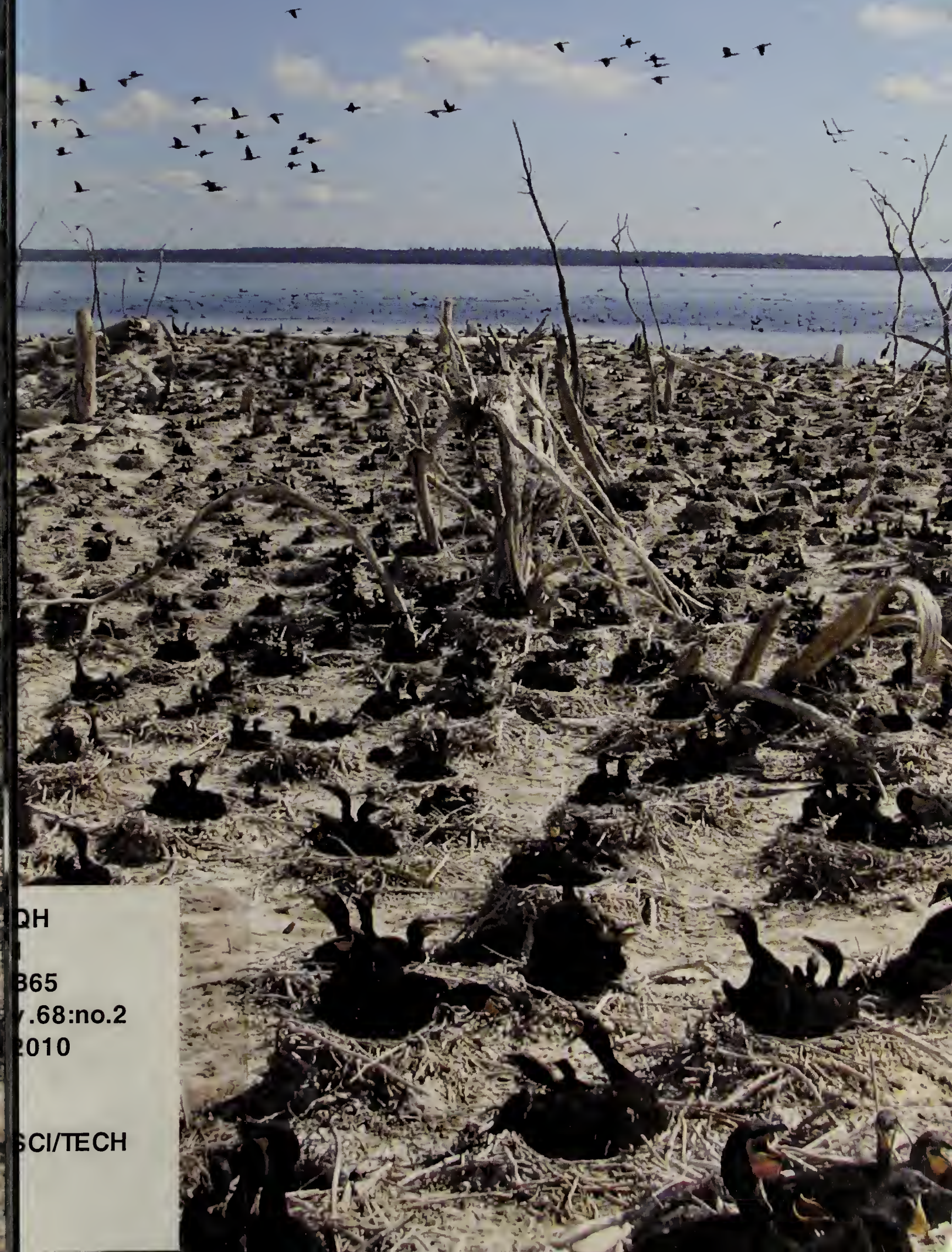


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# BLUE JAY

Volume 68 Number 2

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Figure 1. Baltimore Checkerspot butterfly. Dorsal (left) and ventral (right) views. See article by Taylor & Westwood on p. 87. Peter Taylor



Sora Rail.

Nick Saunders

Front cover: Double-crested Cormorant colony (approximately 3,000 breeding pairs) on Egg Lake, SK. This colony is located at the edge of the Boreal Plain ecozone, and birds breeding here are observed flying to forage on nearby lakes in both the Boreal Plain and Boreal Shield ecoregions. For more on this colony, see article by Doucette et al. on p. 71. Jennifer L. Doucette

Back cover: Mystery Photo – see p. 109.

Harvey Schmidt

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# GUIDELINES FOR AUTHORS

## (EFFECTIVE AS OF SEPTEMBER 2010)

**Aims and Scope:** *Blue Jay* is the quarterly journal of Nature Saskatchewan and publishes articles on the natural history of the prairie provinces and adjacent regions. Submission of Articles, Notes, Photo Notes, Letters, and Book Reviews on the natural history, ecology, and conservation of all flora and fauna in the prairie provinces is encouraged. Similar to other journals, all scientific submissions are reviewed by the editors and at least one other person competent in the subject area, and manuscripts are accepted for publication only after approval by the reviewers and editors. In contrast to other scientific journals, the editors of *Blue Jay* are willing in most cases to work with authors to make manuscripts publishable, thereby facilitating publication by non-professional scientists. *Blue Jay* also publishes poetry and artwork relevant to prairie natural history. All members of Nature Saskatchewan are encouraged to write for *Blue Jay*, and submissions from non-members are equally welcome.

Only manuscripts prepared using a computer and word processor (preferably Microsoft Word) are acceptable. The editors may make exceptions to this rule to accommodate those who do not have access to computer equipment. However, because all documents must be put into electronic form before being sent to the printer, electronic submission (preferably by E-mail) is essentially a must.

These guidelines are intended to help writers in the preparation of manuscripts as well as to streamline and ease the task of editing. Manuscripts that do not follow these guidelines will still be considered for publication, although extensive

modifications will need to be made by the author, as needed, during the review process. Authors should strive to submit complete manuscripts that have been carefully constructed and proofread.

PLEASE NOTE: Before submitting a manuscript to *Blue Jay*, all authors, new and experienced, are asked to read these guidelines from beginning to end, paying special attention to the sections on tables and figures (2.6 & 2.7), references (2.8), how to submit photographs (4.1), and how to make electronic submissions (1.2 & 5).

There are two basic formats for manuscripts published in *Blue Jay*: one for longer ARTICLES and another for shorter NOTES, PHOTO NOTES, LETTERS, and BOOK REVIEWS. Differences in style between these two categories, where they exist, are noted below.

### 1 - Preparation of Manuscripts

1.1 - Writing Style: The writing style should be suitable for other naturalists and scientists, but also accessible to the general public. This does not mean that content must be limited to simple subjects, but rather that the writing should be clear and devoid of jargon and unnecessary technical terms. Scientific articles also should be written in an easily-readable style. American, British, or Canadian English may be used, but please be consistent within a manuscript.

1.2 - Word Processors and Computers: Use 12-point, Times New Roman font, one-inch margins and left justification. Limit formatting commands to **bold** and *italics*. Please Do Not use features such

as hanging indents, customized tab settings, columns, or tables. These create extra work during editing and printing.

1.3 - Typewritten and Handwritten submissions: Please do not submit these unless you have no access to a computer or word processor. Double space the entire manuscript. Double underline words that are to appear in italics.

1.4 - Scientific Names: For **all** species, both the common and scientific (*Latin*) name should be used the first time the species is mentioned, and in the following format: common name (*Genus species*). Thereafter, only the common name is used. Common names are written in lowercase unless a proper noun is included (e.g., “American robin”, “double-crested cormorant”). It is not necessary to include the scientific name for species that are only tangential to the main focus of the text.

Choosing the appropriate common name can be problematic in some instances; the associate editors and editors will try to supply standardized or widely-used common names as needed. The following references are used by *Blue Jay* as sources of standardized common names.

American Ornithologists Union (1998) Checklist of North American Birds. 7th Edition. American Ornithologists Union, Washington, DC.

Wilson DE, Reeder DM (eds) (1993) Mammal Species of the World. Smithsonian Institution Press, Washington, DC. Available at: <<http://nmnhwww.si.edu/msw/>>

Layberry RA, Hall PW, Fontaine JD (1998) The Butterflies of Canada. University of Toronto Press, Toronto, ON.

The Committee on Standard English and Scientific Names (Crother BI, Chair) (2008) Scientific and Standard English Names of Amphibians and Reptiles of North America North of Mexico, with Comments Regarding Confidence in our Understanding, 6th Edition. Society for the Study of Amphibians and Reptiles, St. Louis, MO.

1.5 - Names of People: In general, people should be referred to by first and last names (initials may replace the first names) and without titles such as Dr., Mr., Ms., etc. Rarely, it may be appropriate to use official titles (Her Majesty Queen Elizabeth II versus Betty Windsor). The names of people should be included in the text of an article or note only when central to the topic being discussed.

1.6 - Numbers: Numbers from one to ten (inclusive) are written as words; however, numerals (digits) are always used with standard units of measure, including dates, times, page numbers, percentages, etc. (e.g., 2 km, 7%). Numerals are used for all numbers 11 or larger. Do not begin a sentence with a numeral; reword the sentence, write out the number in words, or end the preceding sentence with a semi-colon. Use words to shorten very large numbers (e.g., 1.6 million).

1.7 - Time: Time should be expressed using the 24-hour clock, given as four digits, two each for hours and for minutes, separated by a colon and followed by ‘h’ for hours, (e.g., 08:30 h, 20:30 h).

1.8 - Distance: Measures of distance should be given in the metric system. There is no period following the abbreviated symbols in the metric system, e.g., “kilometre” is designated as “km”, “metre” as “m”, “centimetre” as “cm”, etc.



1.9 - Direction: Directions are indicated by abbreviations: N, S, E, W, NE, NW, SE, SW, all upper case and without periods.

If there is uncertainty about aspects of format and style, consult a recent issue of *Blue Jay* for similar types of articles, or contact the editors.

## 2 - Format

2.1 - Titles: Titles of articles are in UPPER CASE and begin at the left hand margin at the top of the first page. For book reviews, the title of the review is the title of the book being reviewed. It is followed by a complete reference citation for the book (see section 2.8 below), including the current retail price in hard and/or soft cover, and the ISBN number.

2.2 - Authors' Names: For ARTICLES, names are written in standard upper and lower case and begin at the left hand margin following the title, and they are separated by commas. Names are followed by superscripts corresponding to each author's address(es). For NOTES, PHOTO NOTES, LETTERS, and BOOK REVIEWS, names are written in *italics*, first letters in upper case, and placed as the last line of the manuscript, following the references (if there are any).

2.3 - Authors' Addresses: For ARTICLES, a numbered list of addresses follows the list of authors' names. The numbers must correspond to the appropriate superscript used in the list of authors (see 2.2 above). The complete postal address of each author is given in standard upper and lower case with two-letter abbreviations for provinces and states. The postal (zip) code follows the province/state. The corresponding author's E-mail address follows the postal code in the format "E-mail:<palliser@triangle.net>".

Example title and authors' addresses for ARTICLES are given below:

### VAGRANTS IN SASKATCHEWAN

Johnny B. Goode<sup>1</sup>, Ima Fantastic<sup>1,2</sup>

<sup>1</sup>Department of Biology, University of Regina, Regina, SK, S4S 0A2; E-mail: <jbg@uregina.ca>

<sup>2</sup>81 Martin St., Regina, SK, S4S 3W4

2.4 - Paragraphs: Double-space between paragraphs, without indentation of the first word.

2.5 - Sub-headings: Sub-headings and other subdivisions of the text should be used only when necessary and should be kept to a minimum. The standard format for a sub-heading is upper and lower case in bold-face type (e.g., **Standard Sub-heading**).

2.6 - Tables: Tables are numbered consecutively in the order in which they are cited in the text, and are cited in the text by number (e.g., Table 2). Table titles should be in upper and lower case (e.g., Table 1. Bird numbers). Tables should not be integrated into the text of the manuscript. Instead, each table should be on a separate page placed at the end of the file after the list of references. Use the simplest possible table creation options in your word processor or spreadsheet program.

2.7 - Figures: Figures include all photographs, graphs, maps, and drawings. They are numbered consecutively in the order in which they appear in the text and are cited in the text by number (e.g., Fig. 1). Each figure with its corresponding legend should be submitted on a separate page at the end of the text file, and also separately in a graphic file format such as ".jpg" or ".tif". Electronic graphics should have a resolution of at least 600 DPI.

Photographs should be submitted at the highest possible resolution.

2.8 - References: The references are numbered and are cited in the text as a superscript placed at the end of the sentence to which they refer and after the period that ends the sentence (e.g., ... were described previously.<sup>2</sup>). When more than one reference is cited, superscripts are separated by commas (e.g., ... were described previously.<sup>1,2,5-7,9</sup>). Please note that the reference number follows the period that ends the sentence. References are listed at the end of the text in numerical order according to the sequence in which they appear in the text.

The list of references follows the last paragraph of the text, or the Acknowledgements section if there is one. No sub-heading such as "References" or "Literature Cited" is used. *Titles of journals and magazines* (but not of books) are *italicized*. Titles of journals and magazines should be written out in full, and not abbreviated.

Examples of the format used for the most common types of references are given below.

#### Books:

1. Kaufman K (1996) *Lives of North American Birds*. Houghton Mifflin, Boston, MA.

#### Journal or Magazine Articles:

1. Kydd TE, Barnum PT, Virchow R (1986) Additional observations of the Barred Owl in Alberta. *Blue Jay* 44:41-43.

#### Book Chapters:

1. Heiser CB (1995) The ethnobotany of domesticated plants. In: Shultes RE, von Reis S (eds) *Ethnobotany, Evolution of a*

*Discipline*. Dioscorides Press, Portland, Oregon. p. 200-203.

It is the responsibility of the authors to ensure that the citations in the list of references are accurate and complete in all details. Inaccurate citations are a disservice to readers, so PLEASE make sure that each citation is sufficiently complete that readers could find each reference in an appropriate library or book outlet.

### **3 - Photographs and Artwork**

Photographs, drawings, and other artwork related to the natural history of the prairie provinces and adjacent regions are always welcome submissions, regardless of whether they are associated with an article. *Blue Jay* maintains a file of such illustrations and uses them whenever there is an opportunity to do so. The name of the photographer or artist should be included along with a caption. See guidelines below for submission of photographs and artwork. Photographs and artwork submitted will become part of *Blue Jay's* permanent collection.

### **4 - How to Make Submissions to *Blue Jay***

Only manuscripts created using a computer and word processor should be submitted to *Blue Jay*, other than in rare circumstances where no access to such equipment is possible. Accompany each submission with a short E-mail message giving a name, postal address, telephone number, and E-mail address of the person to be contacted about the article.

In the rare case that a manuscript is hand-written or prepared on a typewriter, two copies of high quality should be mailed directly to the editors. Authors should themselves retain one complete copy of the manuscript. Photographs and other illustrations do not need to be submitted in duplicate.



4.1 - Photographs: Electronic submissions are preferred. Please send photographs as E-mail attachments or on CD. All photographs should be submitted at the highest-possible resolution, at least 600 DPI. Captions for photographs that are not submitted as figures in a manuscript should be included with the photographs (e.g., in an E-mail message, if submitting photographs electronically by E-mail, or with the submitted CD).

4.2 - Drawings and Other Artwork: These should be submitted following all the above guidelines for photographs. Valuable artwork should not be submitted in the original. Instead, a high-quality photocopy, photograph or electronic image should be submitted.

## 5 - Electronic Submissions

Manuscripts submitted in electronic form must be submitted in **Microsoft Word**; E-mail is preferred, but CDs are also acceptable. (Please DO NOT submit 3.5" floppy disks.)

E-mail. The manuscript should be sent as an attached file. Do not use HTML

format when sending manuscripts by E-mail. The editors' E-mail address is <kjoss@sasktel.net>. Illustrations and figures not sent electronically should be mailed to the editors and clearly identified by title and author(s) as belonging to the manuscript. If there is any question about how to send a document by E-mail, please contact the editors for advice.

CD: CDs can be sent to the editors by regular mail. Apple/MacIntosh computer users should ensure that the file on CD is in IBM-compatible format and not in Apple/MacIntosh format. Problems with format incompatibility can be overcome by sending the manuscript by E-mail.

## 6 - Submission Deadlines

Submission deadlines are: 1 January (for the March issue), 1 April (for June), 1 July (for September), and 1 October (for December).

**Further Information**: contact the editors (Vicky Kjoss and Chris Somers) at 81 Martin St., Regina, SK, S4S 3W4; E-mail: <kjoss@sasktel.net>



*Nature is just enough; but men and women must comprehend  
and accept her suggestions.*

*-Antoinette Brown Blackwell*



## DOUBLE-CRESTED CORMORANTS EXPAND THEIR BREEDING RANGE ONTO THE BOREAL SHIELD IN SASKATCHEWAN

JENNIFER L. DOUCETTE, Department of Biology, University of Regina, Regina, SK; E-mail: <douce2je@uregina.ca>; ALEKSANDRA BUGAJSKI, Department of Biology, University of Regina, Regina, SK; MARK DUFFY, Saskatchewan Ministry of Environment, La Ronge, SK

In Saskatchewan, Double-crested Cormorants (hereafter cormorants) nest in colonies on lakes in the southern Prairie and central Boreal Plain ecozones. The largest known Saskatchewan cormorant colonies (e.g., Primrose Lake, Dore Lake, and Lavallee Lake) are found on highly productive lakes in the Boreal Plain (Fig. 1); however, a previously undocumented large colony (which we describe here) on Egg Lake southwest of La Ronge (see cover photo), is at the northern limit of the Boreal Plain ecozone. In addition, in 2009 we surveyed four breeding colonies of cormorants on Lac La Ronge, which is beyond their historically documented breeding range in Saskatchewan. All colonies are on small islands located some distance from the nearest mainland (Table 1).

Nest counts on Egg Lake were conducted for the first time in 2008. Using spray paint to delineate small areas for counting, the count revealed a total of 3,856 nests on three small islands in the lake. Approximately 3,000 of those were located on the main nesting island (55° 07' N, 105° 33' W), which is very densely populated (see cover photo). This colony was not documented in any of the provincial surveys conducted in 1968 to

1991, or in the 2006 counts. However, cormorants have been observed in the La Ronge area for at least 15 to 20 years (G. Stomp, pers. comm.).

The largest cormorant colony on Lac La Ronge is located on a small granite island in Nut Bay in the western portion of the lake at the transition between the Boreal Plain and Boreal Shield ecozones. There are a number of dead trees on the island and some remaining living vegetation (Fig. 2). This nesting colony first came to our attention (but could have been there longer) in 2007, but since that time cormorants there have not produced any young. In July 2009, we observed 200 nest structures on the island, but no eggs or chicks were present. For comparison, at a well-established colony on Dore Lake (54° 46' N, 107° 17' W), cormorants begin incubating eggs in May, and chicks hatch in June (personal observations). Thus, cormorants attempting to nest in Nut Bay were well behind schedule in comparison to other locations at similar latitude. The cause for apparent breeding failure at this site is uncertain.

During the summer of 2008, two previously unknown smaller colonies were discovered on Lac La Ronge. They

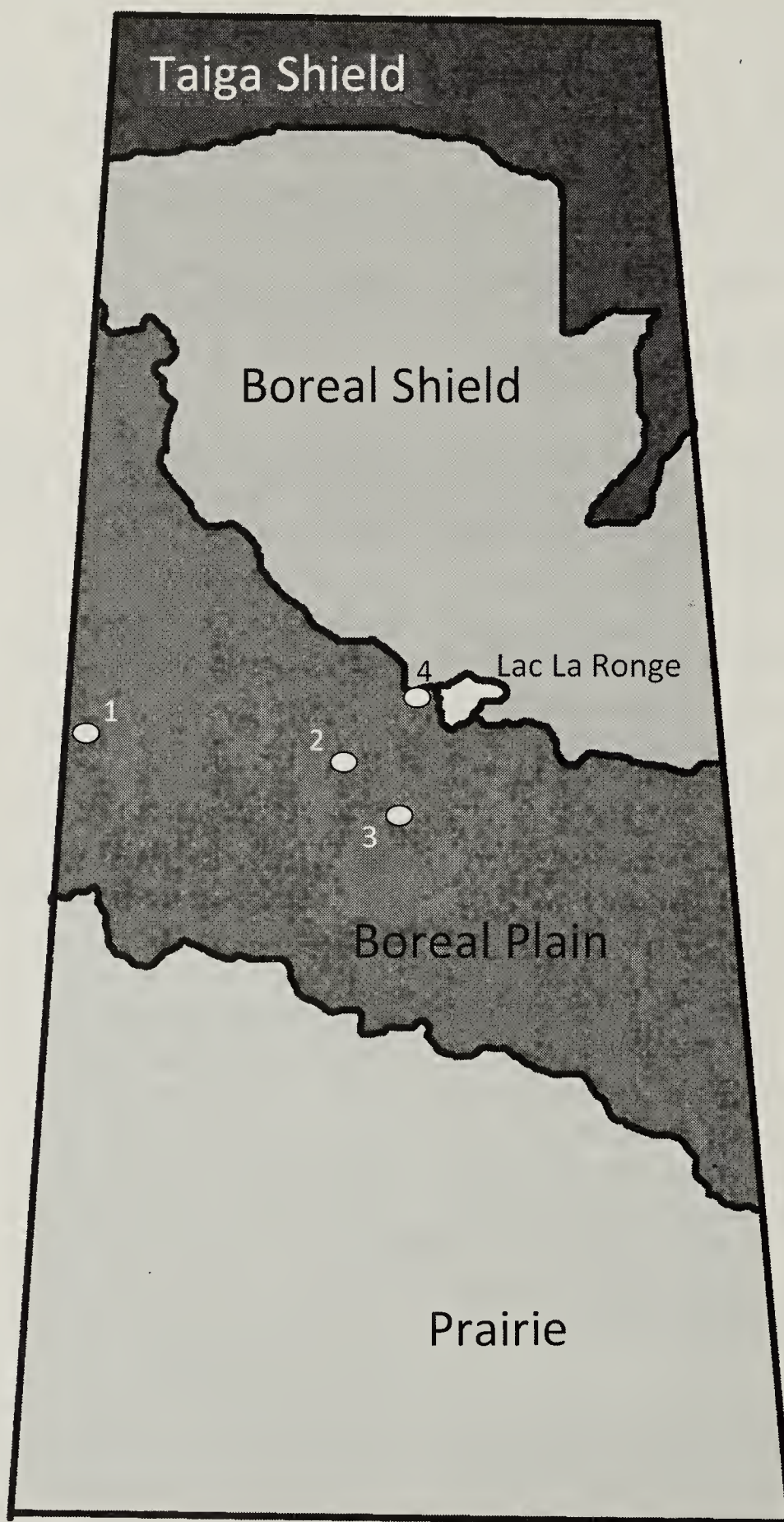


Fig. 1. Saskatchewan is divided into four ecozones. Historically, cormorants have nested in the Prairie and Boreal Plain ecozones, but recently have expanded into the Boreal Shield at Lac La Ronge. Saskatchewan's three largest cormorant colonies at the time of this study were located on the Boreal Plain: Primrose Lake (1), Dore Lake (2), and Lavallee Lake (3). Egg Lake (4), just west of La Ronge, is located at the extreme edge of the Boreal Plain.



**Table 1. New Double-crested Cormorant breeding colonies observed on islands in Lac La Ronge, SK, during July 2009. Nest numbers are estimates and have been rounded to the nearest five.**

General Location	Coordinates	No. of nests
Nut Bay	55°10.653 N 105°11.555 W	200
4 km east of Long Island	55°04.680 N 104°53.825 W	50
4 km east of Long Island	55°04.782 N 104°53.703 W	175
South of High Island	55 ° 09.314 N 105 ° 03.501 W	Unknown, but few
	<b>TOTAL</b>	<b>&gt;425</b>

were located on small, granite islands in the central portion of the lake, east of Long Island and approximately 22 km from the colony in Nut Bay (Fig. 3). The larger island had 175 nests, while the smaller had 50. Most nests contained eggs in July, and unfledged juvenile birds (Fig. 4) were observed on a subsequent visit in August. The vegetation used to construct nest structures was new and devoid of guano, indicating that these colonies are likely no more than a few years old. A fourth colony was discovered on a rock reef south of High Island in

August 2009. This small colony is located approximately halfway between the Nut Bay and Long Island colonies. Adults were observed on nests, so the island was not approached for a nest count; however, this was a small colony similar in size to the others.

Populations of Double-crested Cormorants are recovering throughout North America after a major decline in productivity in the late 19<sup>th</sup> and early 20<sup>th</sup> centuries likely due to human persecution and pesticide contamination (e.g., DDT).<sup>1,2</sup>



*Figure 2. Double-crested Cormorant colony in Nut Bay, Lac La Ronge, SK, is the first documented cormorant colony on Lac La Ronge.*  
*Jennifer L. Doucette*



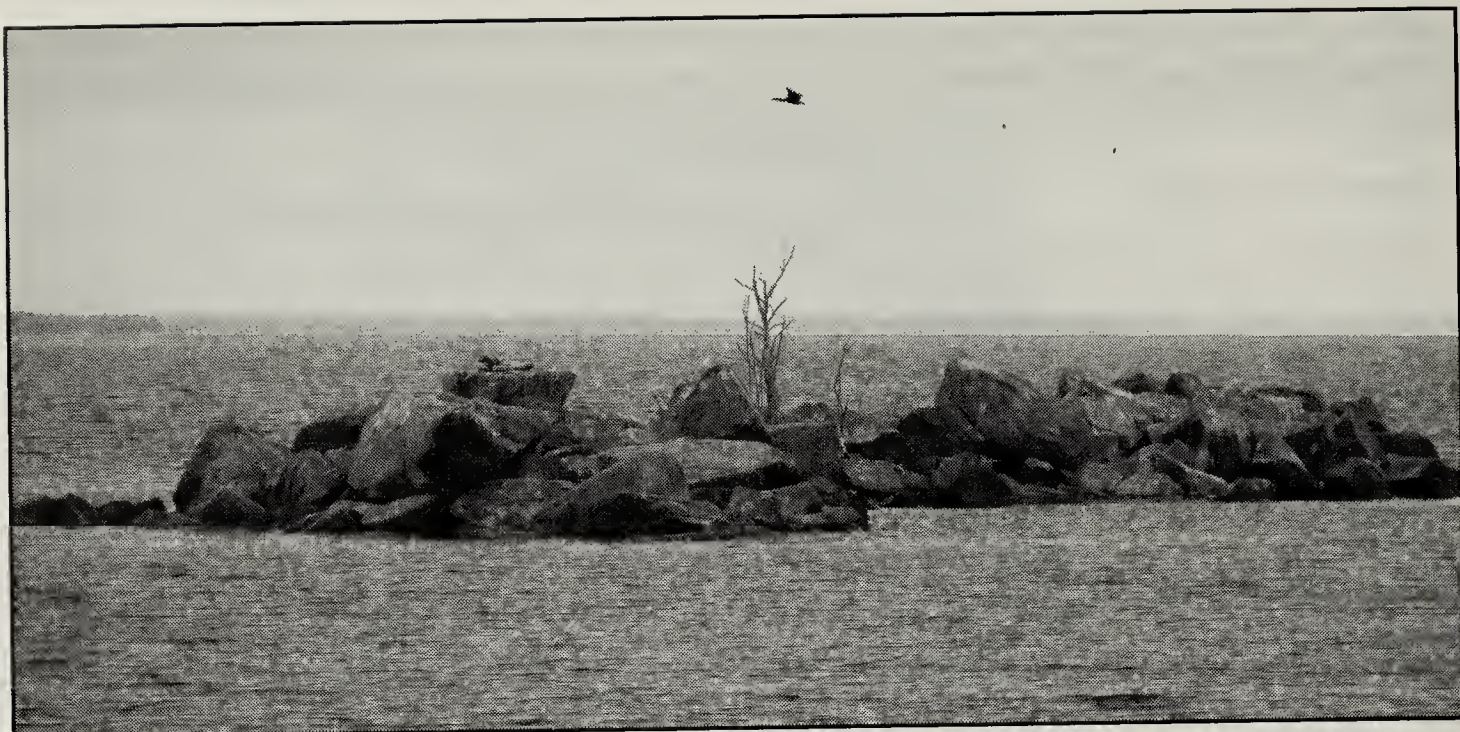


Figure 3. Double-crested Cormorant colony with 50 nests located east of Long Island, Lac La Ronge, SK. The La Ronge cormorant colonies are the first known colonies in the Boreal Shield region of Saskatchewan.

Aleksandra Bugajski

Little is known about cormorant breeding colonies in Saskatchewan before this time, so it is unclear whether cormorant colonies have ever previously existed on the Boreal Shield. The low productivity of northern lakes typically does not support large numbers of avian predators, and no previous records of cormorants breeding on Lac La Ronge exist. The cause of what is likely a recent northern range expansion for these birds is unknown, but it will be important to understand how these novel predators fit into Boreal Shield lake ecosystems.

1. WESELOH, D. V., P. J. EWINS, J. STRUGER, P. MINEAU, C. A. BISHOP, S. POSTUPALSKY, and J. P. LUDWIG. 1995. Double-crested cormorants of the Great Lakes: Changes in population size, breeding distribution and reproductive output between 1913 and 1991. *Colonial Waterbirds* 18 (Special Publication 1):48-59.

2. WIRES, L.R. and F.J. CUTHBERT. 2006. Historic populations of the double-crested cormorant (*Phalacrocorax auritus*): Implications for conservation and management in the 21<sup>st</sup> century. *Waterbirds* 29:9-37.



Figure 4. Unfluffed juvenile Double-crested Cormorants.

Jennifer L. Doucette



# AMERICAN WHITE PELICANS AND DOUBLE-CRESTED CORMORANTS IN SASKATCHEWAN: POPULATION TRENDS OVER FIVE DECADES

CHRISTOPHER M. SOMERS, University of Regina, Department of Biology, Regina, SK, S4S 0A2; E-mail: <chris.somers@uregina.ca>; VICTORIA A. KJOSS, University of Regina, Department of Biology, Regina, SK, S4S 0A2; FREDERICK A. LEIGHTON, Canadian Cooperative Wildlife Health Centre, Western College of Veterinary Medicine, University of Saskatchewan, Saskatoon, SK, S7N 5B4; DAN FRANSDEN, Parks Canada, Prince Albert National Park of Canada, PO Box 100, Waskesiu Lake, SK, S0J 2Y0.

## Abstract

We conducted a province-wide census of breeding American White Pelicans and Double-crested Cormorants in Saskatchewan in 2006. Pelican numbers have increased from a low of 4,560 pairs in 1976 to a high of 31,991 pairs in 2006. Approximately 73% of the current breeding pelican population is found on lakes in the central Boreal Plain ecozone (major colonies on Primrose, Lavallee, and Suggi Lakes). Double-crested Cormorant numbers have increased from a low of 1,080 pairs in 1968 to a high of 34,057 pairs in 2006. Approximately 91% of the current breeding cormorant population is found on lakes in the central Boreal Plain ecozone, with colonies on Dore Lake alone containing over one-third of Saskatchewan's cormorants (other major colonies are on Kazan and Suggi Lakes). Dore Lake breeding populations of cormorants and pelicans have fluctuated dramatically over recent years (1996 to 2009). The causes of recent population changes at the provincial or individual colony level are unclear; however, larger populations of cormorants and pelicans have heightened perceived conflicts between fishermen and these piscivorous birds.

## Introduction

American White Pelicans (hereafter pelicans, Fig. 1) and Double-crested Cormorants (hereafter cormorants, Fig. 2), two of Saskatchewan's largest waterbirds, have breeding colonies on many lakes in the province. These species were historically relatively rare in Saskatchewan, and therefore of significant interest from a conservation perspective. Thus, sporadic aerial surveys were conducted to estimate population sizes of these birds over the period spanning 1968 to 1991.<sup>7–12,14,15</sup> In 1987, pelicans were delisted as a species threatened with extinction by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), and interest in provincial population trends (and thereby aerial surveys for both species) diminished shortly thereafter.

Since the last of the sporadic aerial surveys in 1991, cormorants have increased in number in virtually all parts of their North American range.<sup>16</sup> The presence of large numbers of these fish-eating birds in locations where they were historically less numerous or absent has generated significant conflict over fisheries resources.<sup>2,3</sup> Recent





*Figure 1. Nearly fledged juvenile American White Pelicans from a breeding colony on Reed Lake, near Morse, SK. Pelicans have recently increased in numbers over much of their North American range.*  
Chris Somers

complaints regarding increasing numbers of cormorants on Saskatchewan lakes suggested that populations may be growing here as well (K. Murphy, pers. comm.). Pelicans were also reported to be increasing in numbers in North America,<sup>5</sup> and are the subject of control measures due to fisheries conflicts in some areas of the U.S.A.<sup>4</sup> Fisheries conflicts combined with some alarming events, such as the temporary abandonment of the Chase Lake, North Dakota, breeding colony by nearly 16,000 pairs of pelicans in 2004,<sup>13</sup> renewed interest in Saskatchewan pelican population trends.

Here we report the results of the most recent province-wide census of pelicans and cormorants in Saskatchewan conducted in 2006, and analyze long-term population trends beginning in 1968. In addition, we report a specific case study on recent population trends for pelicans and cormorants nesting on Island A, Dore Lake, which is the largest single breeding colony of cormorants in Saskatchewan.

## Methods

To estimate 2006 population sizes of breeding cormorants and pelicans, we aerially surveyed potential colonial bird nesting islands on 19 Saskatchewan lakes during late May and early June of 2006. The locations surveyed (Fig. 3) were selected based on the most recent previously published provincial census conducted by the Royal Saskatchewan Museum.<sup>12</sup>

At occupied sites, aerial photographs of nesting areas were taken from a fixed-wing aircraft as it circled over the islands at an altitude of 250–330 m. We used a Canon EOS digital SLR camera equipped with either a 55–75 mm or 100–300 mm zoom lens to take photographs. In general, we took multiple frames to cover the entire surface area containing nesting birds. These images were later enlarged in Adobe Photoshop, edited to eliminate overlap between frames, and enlarged further before being printed so that detailed nest counts could be





*Figure 2. Sub-adult Double-crested Cormorant foraging in Wascana Lake, Regina, SK. Cormorants have recently become more numerous across most of their North American range and are often visible in urban settings like this one.* Chris Somers

conducted. Figure 4 shows an example of a frame taken of a mixed colony in the Last Mountain Lake National Wildlife Area. For all locations we counted birds that appeared to be incubating eggs, and excluded individuals that were standing near nests, loafing near the colonies, or flying. Thus, all population size estimates are expressed as the number of active nests, rather than the number of birds.

In addition to the province-wide census of pelicans and cormorants described above, we also estimated the population size of breeding cormorants and pelicans on Island A (Bazil Bay) of Dore Lake annually from 1996 to 2009. This colony is of particular interest due to its large size, history of perceived fisheries conflicts between the birds and local fishermen, and long-term studies of cormorant-pathogen interactions.<sup>1,6</sup> Aerial photographs for these annual counts were taken from a helicopter hovering at approximately 300 m altitude slightly

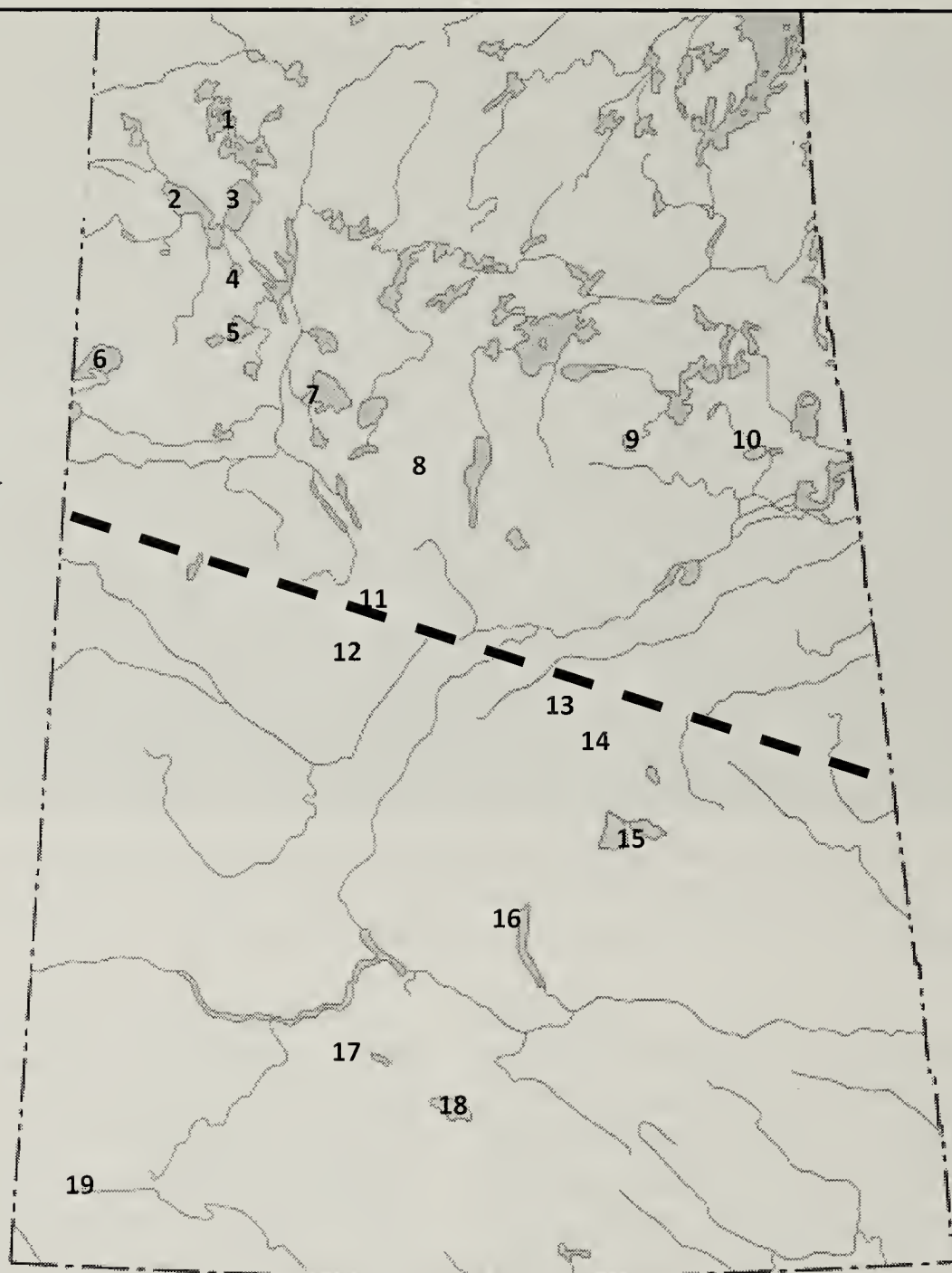
offset from the breeding island. This approach results in photographs being taken at a slightly oblique angle, but prevents the helicopter from disturbing the colony. Counts of nesting birds were conducted from photographs in a manner similar to that described above.

### **Provincial Census Results**

*American White Pelicans* - The total number of pelican nests in Saskatchewan has increased significantly over the past 38 years (linear regression,  $r^2 = 0.866$ ,  $P < 0.001$ ; Fig. 5) to an estimated total of 31,991 nests in 2006 (Table 1). The observed average rate of increase for the province was 669.<sup>2</sup> nests per year.

When analyzed by major ecozone, pelican nest numbers have increased significantly over time in both the southern Prairie ecozone ( $r^2 = 0.661$ ,  $P = 0.009$ ; Fig. 6) and the central Boreal Plain ecozone ( $r^2 = 0.849$ ,  $P = 0.001$ ; Fig. 6). The percentage of nesting birds in Boreal





- |                    |                             |
|--------------------|-----------------------------|
| 1. Wasekamio Lake  | 11. Iroquois Lake           |
| 2. Peter Pond Lake | 12. Redberry Lake           |
| 3. Churchill Lake  | 13. Basin Lake              |
| 4. Kazan Lake      | 14. Lenore Lake             |
| 5. Canoe Lake      | 15. Mud (Middle Quill) Lake |
| 6. Primrose Lake   | 16. Last Mountain Lake      |
| 7. Dore Lake       | 17. Reed Lake               |
| 8. Lavallee Lake   | 18. Old Wives Lake          |
| 9. Big Sandy Lake  | 19. Cypress Lake            |

*Figure 3. Location of Saskatchewan lakes surveyed for Double-crested Cormorant and American White Pelican nesting colonies during the 2006 provincial population census. Sites were selected based on previous surveys conducted by the Royal Saskatchewan Museum. The dashed line indicates the approximate transition between Boreal Plain and Prairie ecozone colonies as discussed in the text.*





*Figure 4. Example of an aerial photograph used to count American White Pelican and Double-crested Cormorant nests in the Saskatchewan provincial survey, 2006. This frame shows approximately one-third of the main breeding island for these two species in the Last Mountain Lake National Wildlife Area.*

*Chris Somers*

Plain colonies increased from 1976 through 1991, but a minor resurgence in the percentage of prairie nesters occurred in 2006. In general, colonies on Boreal Plain lakes have consistently had a higher percentage of the province's nesting pelicans, and in 2006, 23,414 of 31,991, or 73.2% of pelican nests were in colonies on Boreal Plain lakes, compared to 8,577 of 31,991, or 26.8% on Prairie lakes. In the 2006 survey, colonies on Lavallee (22.5%), Primrose (16.4%), and Suggi (15.5%) Lakes were by far the largest in the province and collectively supported more than half of Saskatchewan's nesting pelican population.

*Double-crested Cormorants* – The total number of cormorant nests in

Saskatchewan has increased significantly over the past 38 years ( $r^2 = 0.948$ ,  $P < 0.001$ ; Fig. 7) to an estimated total of 34,057 nests in 2006 (Table 2). The observed average rate of increase for the province was 867.8 nests per year. Cormorant nest numbers have increased significantly over time in both the Prairie ( $r^2 = 0.476$ ,  $P = 0.035$ ; Fig. 8) and Boreal Plain ecozones ( $r^2 = 0.941$ ,  $P < 0.001$ ; Fig. 8). There has been a marked shift over time away from an approximately even distribution of cormorant nest numbers in Prairie and Boreal Plain ecozones, such that in 2006, 31,110 of 34,057, or 91.3% of Saskatchewan's cormorant population nested on Boreal Plain lakes, compared to only 2,947 of 34,057, or 9.7% on Prairie lakes. In the 2006 survey, Boreal



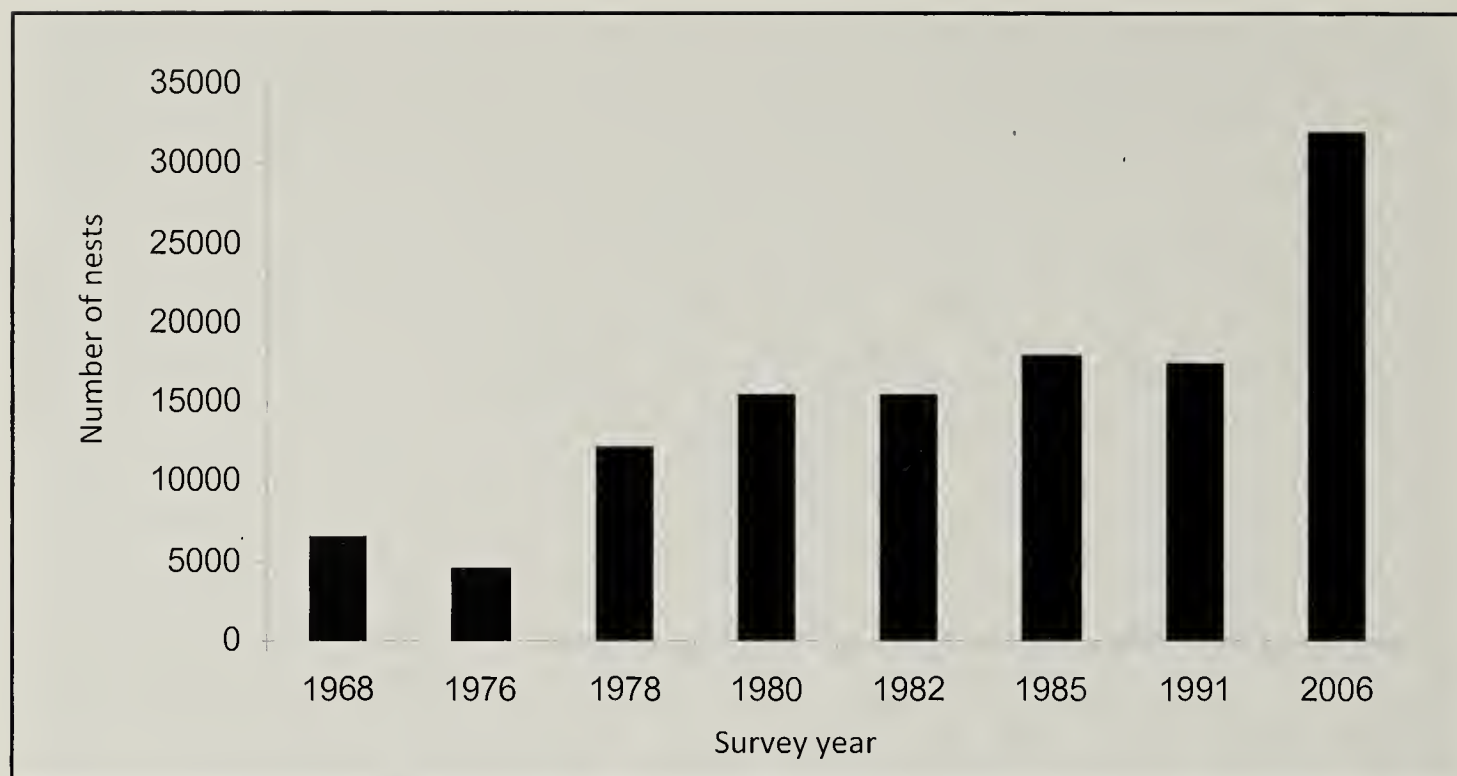


Figure 5. Numbers of breeding American White Pelicans (nests) counted in Saskatchewan during the period 1968–2006. Counts for the 1968–1991 period are from previously published censuses conducted using similar methods.

Plain colonies on Dore (33.8%), Kazan (23.3%), and Suggi (13.0%) Lakes were by far the largest in the province and collectively supported more than 70% of Saskatchewan’s breeding cormorant population.

### Dore Lake (Island A) Annual Counts

The number of pelicans nesting on Island A fluctuated over the survey years, ranging from a low of 901 breeding pairs in 1999, to a high of 2,824 pairs just 2 years before (Fig. 9). Since 2005, the general trend has been for a slight increase in pelican numbers. Cormorant numbers on the same island have fluctuated even more dramatically, with a low of 4,171 pairs in 1999, and a high of 11,094 just 1 year prior (Fig. 9). There has been a slight decrease in the number of breeding cormorants on Island A each year since 2006. In 2006, aerial photos of Island A were taken using both the fixed-wing aircraft and the helicopter as described above. Counts from the two sets of photos were different. The fixed-wing version yielded 9,557 cormorant nests, and 1,632 pelican nests, whereas

the photo from the helicopter showed only 8,129 cormorant nests and 1,544 pelican nests. The cause of this difference between methods is unclear.

### Implications of Population Trends

The American White Pelican has a history of conservation issues in Canada and was considered threatened with extinction by the Committee on the Status of Endangered Wildlife in Canada until 1987. In Saskatchewan, pelican numbers reached a historic low in the mid-1970s and have consistently increased since that time. In 2006, there were more breeding pelicans in the province than at any other time surveyed. Thus, measures taken to protect pelicans in Saskatchewan have been extremely effective, and their population growth over the past three decades should be considered a conservation success story. It is currently unclear whether the pelican population will continue to grow, and what factors will determine the ultimate population size in the province. From the perspective of long-term pelican conservation and management in Saskatchewan, it is



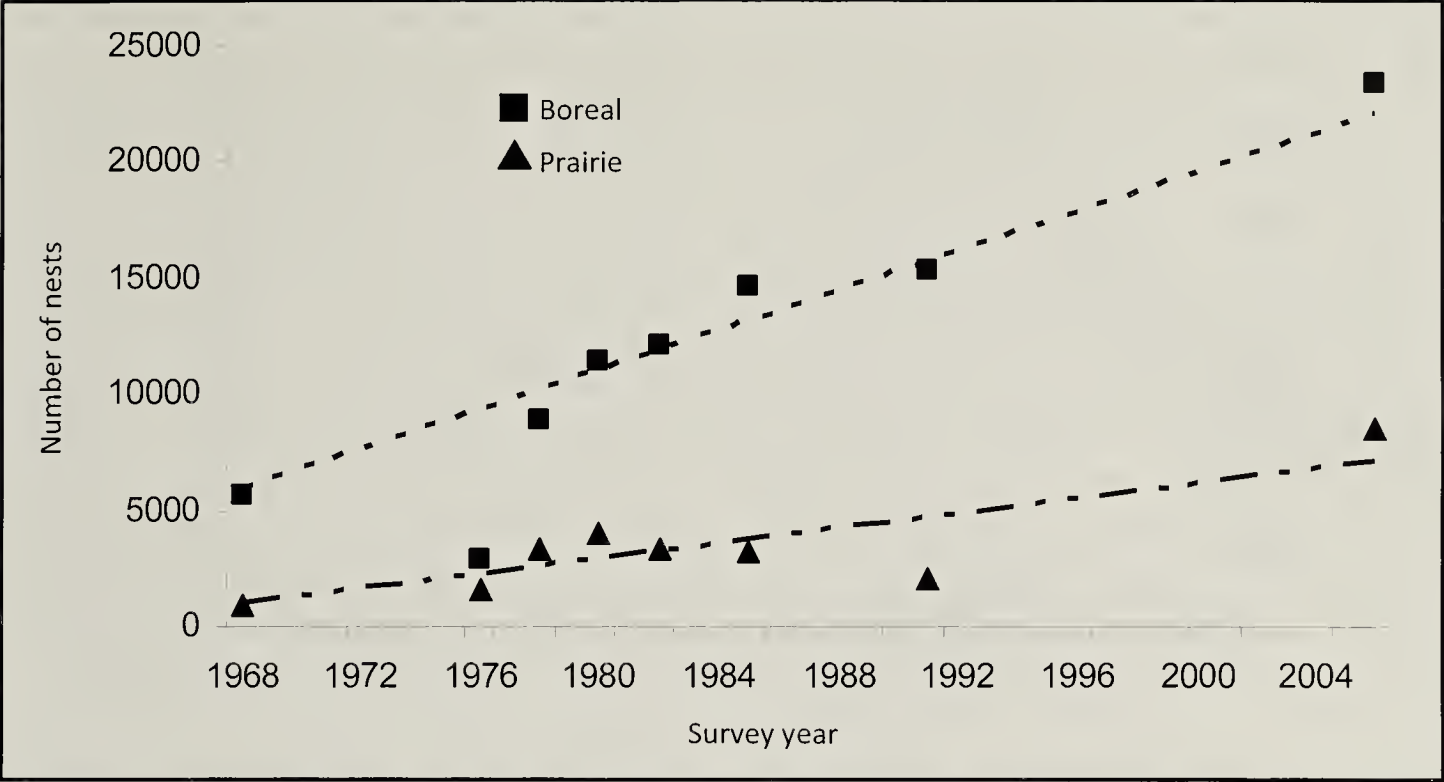


Figure 6. Population trends for American White Pelicans (number of nests) in Saskatchewan based on the location of colonies in either the central Boreal Plain or southern Prairie ecozones. Data from 1968–1991 are from previously published reports.

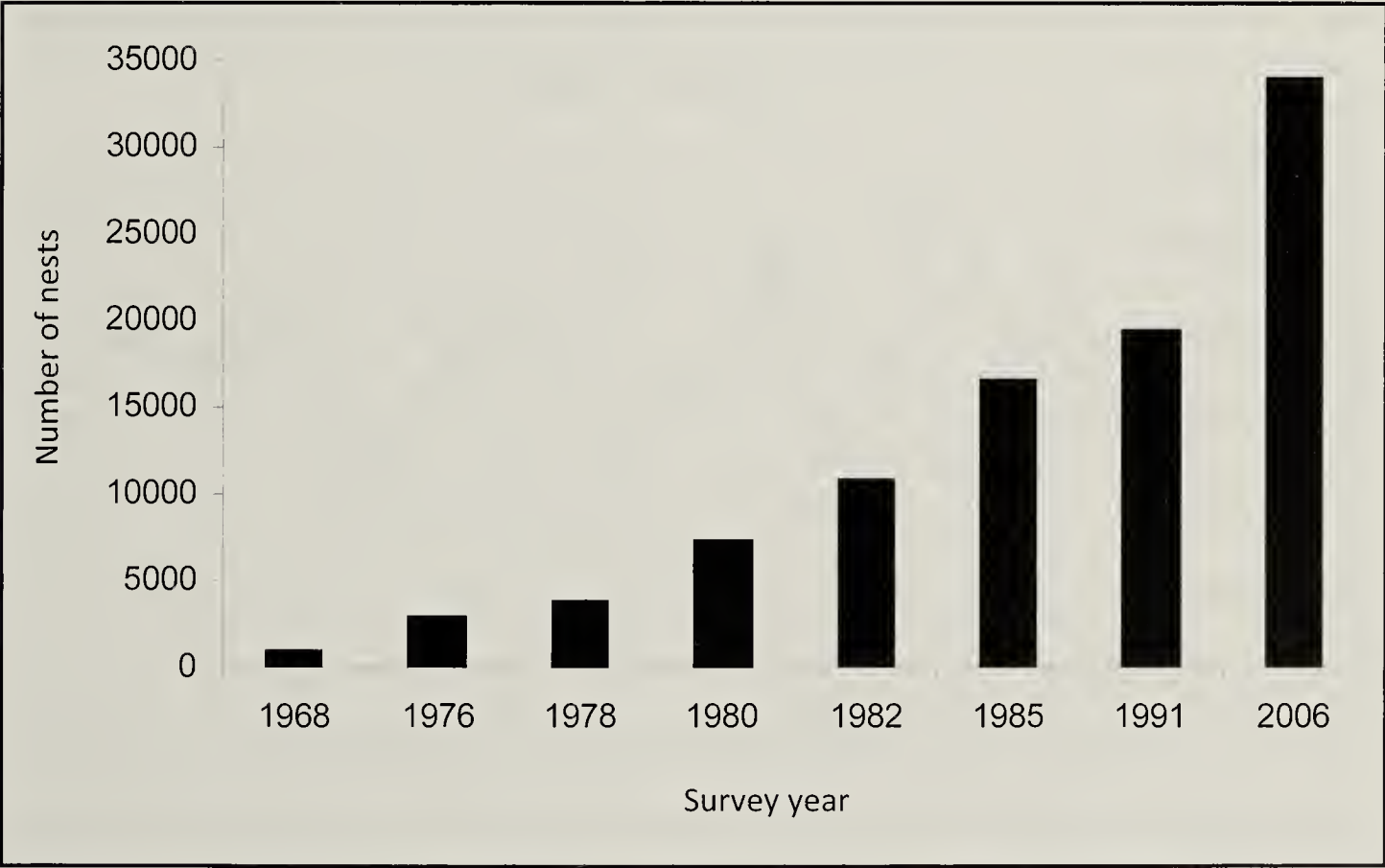


Figure 7. Numbers of breeding Double-crested Cormorants (nests) counted in Saskatchewan during the period 1968–2006. Counts during 1968–1991 were taken from previously published reports.



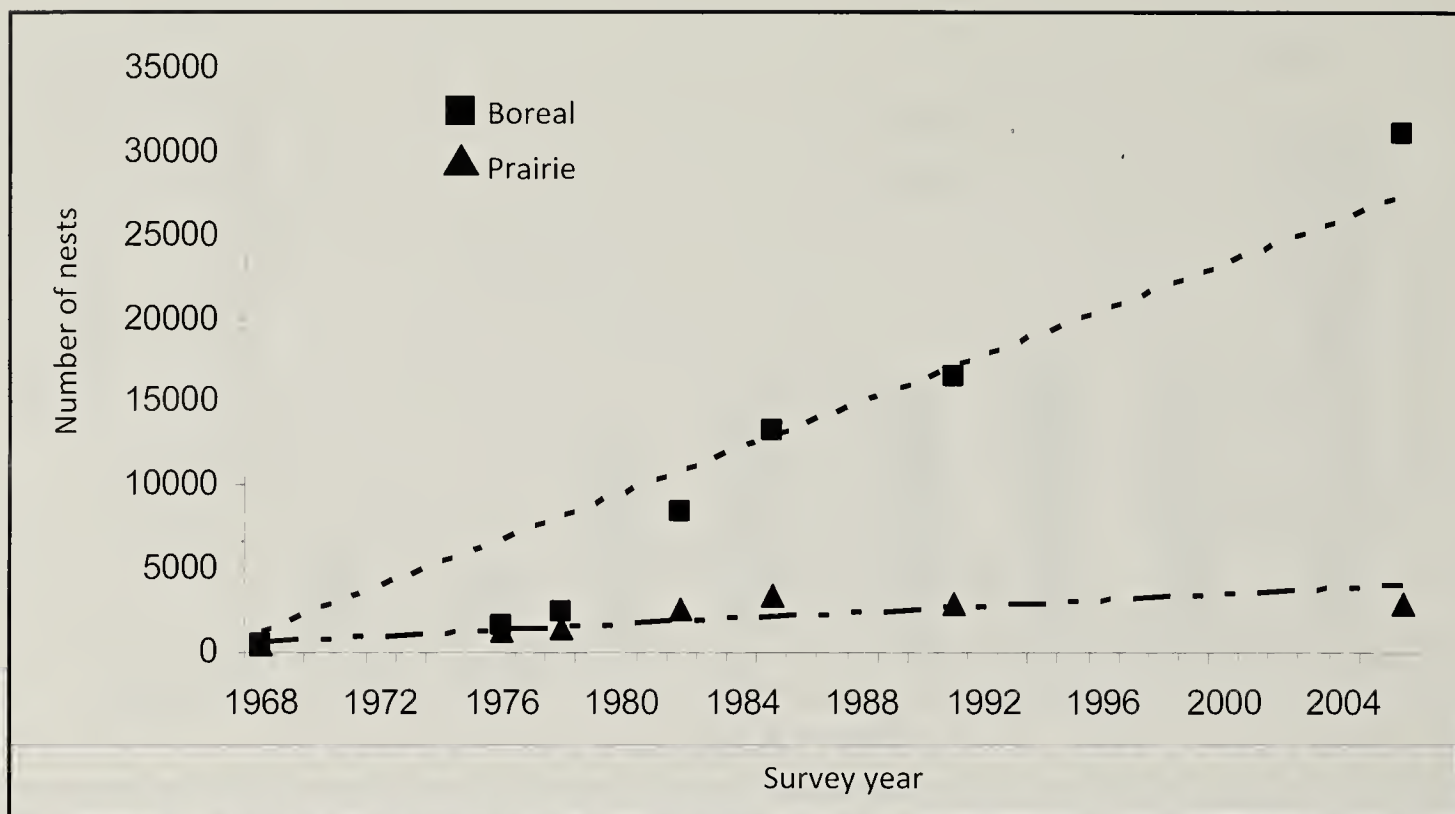


Figure 8. Population trends for Double-crested Cormorants (number of nests) in Saskatchewan based on the location of colonies in either the central Boreal Plain or southern Prairie ecozones. Data from 1968–1991 are from previously published reports.

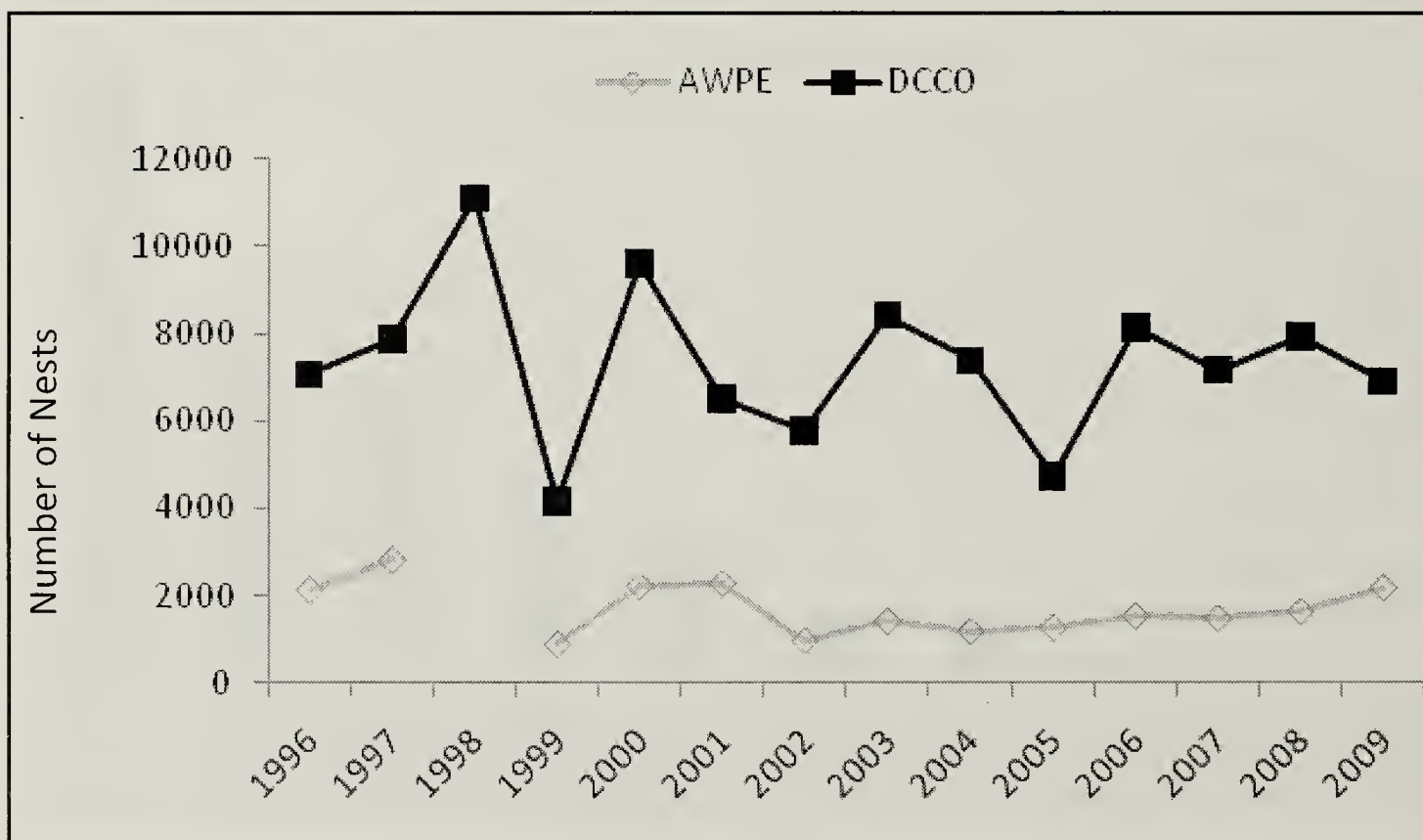


Figure 9. Recent population trends for American White Pelicans (AWPE) and Double-crested Cormorants (DCCO; number of nests) in the breeding colony on Island A in Dore Lake, Saskatchewan. Historical records indicate approximately 3,000 cormorant nests on Dore Lake in 1922; breeding pelicans were present but not counted in 1932.<sup>1</sup>



noteworthy that the majority of breeding birds in the province (54.4%) are currently located in just three colonies on Lavallee, Primrose, and Suggi Lakes in the central Boreal Plain ecozone. These sites share the common feature of having no road access and a nearly complete lack of human activity on the water or surrounding shoreline during the nesting season. If the fourth-largest colony on Kazan Lake (12.0%), which also does not have road access, is included, this brings the proportion of pelicans that nest at sites inaccessible to humans up to two-thirds of the provincial population total. This distribution of nesting birds suggests that: (1) undisturbed colony sites are critically important for maintaining the Saskatchewan pelican population, and (2) 66.4% of the pelican population is concentrated at just four breeding sites. Thus, this species remains potentially vulnerable to human disturbance or other events at breeding colonies despite currently having a large population size.

The situation is much the same for the Saskatchewan cormorant population, which was at a recorded low when the first provincial survey was conducted in 1968, and has increased consistently ever since. In 2006, more cormorants were nesting in the province than at any other time surveyed. Cormorants were severely affected by DDT-related egg shell thinning in the mid-1900s and were considered rare in west-central Canada for many years.<sup>16</sup> The cause of recent cormorant population growth over the past three decades is unknown, but indicates that aquatic environments in Saskatchewan must have suitable conditions, including abundant prey fish, to support large numbers of fish-eating birds. Thus, from a biological and environmental perspective, growing cormorant numbers should perhaps also be viewed as a conservation success story. However, setting the cormorant situation in a conservation

context is problematic because these birds are not revered by the public as pelicans are (perhaps because of a negative perception of cormorant appearance), and both stakeholders and resource managers tend to view cormorant population growth negatively because of a perceived conflict over fisheries resources.<sup>e.g.2,3</sup> In addition, lakes that support large or increasing cormorant numbers may do so because human over-exploitation of top-predator fish (e.g., pike and walleye) causes a shift in food webs, favouring high abundance of forage species that are prey for cormorants but are of little value to anglers or commercial fishermen. Thus, cormorants may be an indicator (rather than the cause) of failing commercial and recreational fisheries, and their presence is highly correlated with stakeholder dissatisfaction. Because systematic recording of cormorant population size in Saskatchewan only began in 1968, we have no historical data for comparison. As an exception, some early data for Dore Lake indicate 3,000 cormorant nests on that lake in 1922.<sup>1</sup> The lack of a province-wide historical perspective on cormorant populations makes it impossible to know whether recent growth represents a resurgence to pre-human settlement numbers, or an unusual range and population expansion triggered by as yet unexplained ecological events.

Nevertheless, some of the same insights above for pelicans are also relevant for cormorants. Like pelicans, a large proportion (~70%) of the provincial cormorant population is currently located in three major colonies, in this case on Dore, Kazan, and Suggi Lakes in the central Boreal Plain ecozone. Suggi and Kazan Lakes are also major colony sites for pelicans, although the order of importance is different for each species. In contrast to pelicans, the largest cormorant colony in Saskatchewan on Dore Lake



Table 1. Colony and population size estimates for breeding American White Pelicans in two eco-regions of Saskatchewan based on aerial photographs. Data from 1968 through 1991 are from previously published reports. The symbol 'x' indicates that a site was not surveyed.

Lake Name	1968	1976	1978	1980	1982	1985	1991	2006
<i>BOREAL PLAIN</i>								
Basin	x	x	x	x	x	227	0	144
Canoe	x	x	x	x	x	x	x	0
Churchill	0	x	x	0	0	0	x	0
Iroquois	x	x	x	x	x	x	0	0
Dore	600	0	x	0	0	0	742	1995
Kazan	902	275	952	768	609	1145	1004	3833
Lavallee	1020	x	3019	3790	3569	4897	4890	7229 <sup>a</sup>
Peter Pond	x	x	x	x	x	x	x	0
Preston	x	x	x	275	95	157	70	x
Primrose	2459	2313	4007	4834	6822	6652	5247	5248 <sup>b</sup>
Suggi	680	325	913	1752	1049	1608	3386	4965 <sup>b</sup>
Wasekamio	x	x	x	x	x	x	x	0
<b>SUBTOTAL</b>	<b>5661</b>	<b>2913</b>	<b>8891</b>	<b>11419</b>	<b>12144</b>	<b>14686</b>	<b>15339</b>	<b>23414</b>
<i>PRAIRIE</i>								
Cypress	12	0	x	0	0	90	0	424
Last Mountain	x	0	x	0	0	0	804	3356
Lenore	x	x	x	110	42	162	0	0
Mud	x	138	232	665	437	462	210	1450
Old Wives	746	1420	3084	3075	2617	2184	582	256
Reed	x	x	x	0	0	0	x	1760
Redberry	139	89	72	168	240	347	524	1331
South SK river	x	x	x	x	0	0	x	x
<b>SUBTOTAL</b>	<b>897</b>	<b>1647</b>	<b>3388</b>	<b>4018</b>	<b>3336</b>	<b>3245</b>	<b>2120</b>	<b>8577</b>
<b>SK TOTAL</b>	<b>6558</b>	<b>4560</b>	<b>12279</b>	<b>15437</b>	<b>15480</b>	<b>17931</b>	<b>17459</b>	<b>31991</b>

<sup>a</sup>Photos and nest counts by Parks Canada staff; <sup>b</sup>Aerial photos taken when some pelican chicks were in crèches.



Table 2. Colony and population size estimates for breeding Double-crested Cormorants in two eco-regions of Saskatchewan based on aerial photographs. Data from 1968 through 1991 are from previously published reports. The symbol 'x' indicates that a site was not surveyed.

Location	1968	1976	1978	1980	1982	1985	1991	2006
BOREAL PLAIN								
Basin	x	x	x	x	x	745	0	144
Big Sandy	x	x	x	x	x	x	x	23
Canoe	x	x	x	x	x	x	x	299
Churchill	4	x	104	0	790	2508	2506	457
Iroquois	x	x	x	x	x	x	x	0
Dore	70	130	270	849	1464	2204	2497	11513
Kazan	152	1300	753	1587	2544	3120	3862	7929
Lavallee	122	x	651	747	899	1615	2263	3750
Peter Pond	x	x	x	x	x	x	0	0
Preston	x	x	x	0	0	0	85	x
Primrose	136	43	124	459	1041	1217	2336	2476
Suggi	55	220	579	1153	1666	1837	2648	4439
Wasekamio	x	x	x	x	x	x	394	80
<b>SUBTOTAL</b>	<b>539</b>	<b>1693</b>	<b>2481</b>	<b>4795</b>	<b>8404</b>	<b>13246</b>	<b>16591</b>	<b>31110</b>
PRAIRIE								
Alkali	x	x	x	x	15	0	x	x
Cypress	434	535	395	283	329	553	0	120
Last Mountain	x	117	337	789	1202	1764	2854	2182
Lenore	x	x	x	670	651	853	0	0
Mud	x	267	72	75	27	26	0	38
Old Wives	45	319	658	693	147	96	0	88
Redberry	62	29	24	43	53	43	102	24
Reed	x	x	x	62	141	45	0	495
South SK river	x	x	x	x	2	0	x	x
<b>SUBTOTAL</b>	<b>514</b>	<b>1267</b>	<b>1486</b>	<b>2615</b>	<b>2567</b>	<b>3380</b>	<b>2956</b>	<b>2947</b>
<b>SK TOTAL</b>	<b>1080</b>	<b>2960</b>	<b>3967</b>	<b>7410</b>	<b>10971</b>	<b>16626</b>	<b>19547</b>	<b>34057</b>



(33.8% of provincial total) is accessible to humans, and the lake is commonly used by anglers throughout the nesting season. However, the most densely populated cormorant nesting island in Bazil Bay is on a portion of the lake that is closed to all fishing activities and thus is effectively in a disturbance-free area. This distribution of nesting birds in the province suggests that: (1) undisturbed colony sites are important for maintaining the Saskatchewan cormorant population, and (2) 81.1% of the cormorant population is concentrated at just four breeding sites; thus, this species remains potentially vulnerable to human disturbance or other events at breeding colonies despite currently having a large population size.

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# INVERTEBRATES

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## RECORDS OF THE BALTIMORE CHECKERSPOT BUTTERFLY IN MANITOBA

PETER TAYLOR, P.O. Box 597, Pinawa, MB, R0E 1L0; E-mail: <taylorp@granite.mb.ca>; and A. RICHARD WESTWOOD, Department of Biology, University of Winnipeg, Winnipeg, MB, R3B 2E9; E-mail: <r.westwood@uwinnipeg.ca>

### Introduction

The Baltimore Checkerspot, also known simply as the Baltimore, is a strikingly marked, eastern North American butterfly (Fig. 1, see inside front cover, top) that reaches its northwestern range limit in southeastern Manitoba.<sup>4,5,7</sup> Like the Baltimore Oriole, its black-and-orange markings recall the armorial colours of the Baltimore family, one-time colonial officials in what is now the state of Maryland. The butterfly's distribution is closely linked to that of the preferred larval food plant Turtlehead (*Chelone glabra*). When fully grown and in bloom, Turtlehead is a conspicuous plant with large, white flowers that often stands above the surrounding vegetation (Fig. 2). It may not reach full height, however, until after the peak Baltimore flight period. It is therefore advantageous to identify Turtlehead in late summer and then search for larvae and adult butterflies the following year. Preferred habitats are often described as grassy marshes and wet meadows, sometimes within forested regions.

### Manitoba Distribution

Just two Manitoba localities for the Baltimore, substantiated by three specimens, are mentioned in *The Butterflies of Manitoba*.<sup>4</sup> Additional records have expanded the known occurrence to six well-separated areas, some including

multiple sites, all within about 100 km north of the U.S. border and 80 km west of the Ontario boundary. Most of the additional records were obtained either (a) during surveys of the butterfly fauna of southeastern Manitoba forests by ARW and co-workers in 1982 and 2001 or (b) by targeted surveys of known Turtlehead localities along Provincial Road (PR) 308 south of East Braintree in 1991 and 2009



Figure 2. Turtlehead (*Chelone glabra*) blooms south of East Braintree, MB, 9 July 1991.  
Peter Taylor



by PT and several fellow naturalists. The 1991 search followed the discovery of Turtlehead plants in bloom at several roadside sites on 1 September 1990.<sup>8</sup> This article documents all the records, some of which have been published previously but in fragmentary fashion.<sup>4,5,8–11</sup> The following list is organized by the six areas mentioned above, in chronological order of discovery. Localities are given with sufficient precision for regional mapping without disclosing the exact coordinates of potentially sensitive colonies.

*Agassiz Provincial Forest* (nominally 50° 0' N, 96° 9' W) — Two specimens at The Manitoba Museum (MM), # 29393 and # 29394, were collected by P. Klassen on 12 July 1974; exact coordinates are unknown.

*Sandilands Provincial Forest* (nominally 49° 22' N, 96° 7' W) — MM specimen # 29391 was collected by C.S. Quelch on 7 July 1977; exact coordinates are unknown.

Habitats for these first two records were “a sandy area adjoining wet forest” and “black spruce bog”, although it is not clear to which site each description applies.<sup>4</sup>

*Near Wampum Provincial Forest* (49° 06' N, 95° 49' W) — Several adults were observed by ARW in the first week of July 1982, although no butterflies were collected. In 2001, Baltimore butterflies were observed by ARW and student assistants in the vicinity of Wampum Provincial Forest on 20 June (five individuals), and 28 June (six individuals), with two specimens being collected from the 20 June group. Butterflies were found frequenting lower, wet areas of shaded trails within Jack Pine (*Pinus banksiana*) forests at locations ranging from approximately 49° 02' N, 95° 48' W to 49° 10' N, 95° 50' W. Butterflies were observed as individuals flying alone and

did not appear to be part of a specific colony. Although “colonies” could have been close by, dense forest hampered the ability to follow individuals through the undergrowth. These sightings were located approximately 6 to 15 km north of the Manitoba-Minnesota international border. The sandy Jack Pine habitat was identified as Manitoba forestry class V24 according to the Manitoba Forest Ecosystem Classification (FEC) for Manitoba.<sup>12</sup>

*PR 308 south of East Braintree* (five sites at or near 49° 28' N, 95° 4' W) — Two individuals were found and photographed about 3.3 km apart by PT, R. Zach, and M. and F. Vogel on 7 July 1991. Three individuals were found and photographed by PT within a 6.4-km stretch of road on 9 July 1991.<sup>8</sup> Five individuals were collected by P. Klassen on 12 July 1991, and are now MM specimens # 29392 and # 29395 to 29398. None was found in extensive searches on 13 and 30 July 2008, but three were found together and photographed at one site within the same stretch of road on 12 July 2009 (PT, A. Aug, L. de March, D. Dodgson, N. Schmidt, R. Zach), and one was photographed there on 18 July 2009 (L. de March, D. Dodgson, G. Budyk). A mating pair was observed at the same location the following day, 19 July 2009 (L. de March, B. de March). All of these observations were made along a highway right-of-way through moist, mixed-wood habitats, with scattered occurrence of Turtlehead in the roadside vegetation.

*“Big Rock” area, southeast of River Hills* (approximately 50° 3' N, 95° 59' W) — One worn but easily identified individual was observed along a cut line through black spruce – tamarack bog by PT and R. Zach on 22 July 2000.

*Whiteshell Provincial Park* (three sites between 49° 50' and 49° 58' N,



95° 21' and 95° 31' W) — The first site was located off Highway 44 in an area with gravel pits and ponds, the second site was located near the junction of Highway 44 and PR 307 in a rocky meadow surrounded by Jack Pine, and the third site was located along PR 307 in a marshy area. Five individuals were observed at these sites between 10 July and 30 July 2001. No specimens were collected. The sites were characterized according to the FEC system as Balsam Poplar Hardwood and Mixed-wood (V1), Jack Pine Conifer (V24), and Red Pine Mixed-wood (V12).<sup>12</sup>

### Behaviour

Much of the observed behaviour was typical of many butterflies, for example, basking on gravel roads, resting in grassy roadside vegetation, and visiting roadside flowers such as thistles and Spreading Dogbane (*Apocynum androsaemifolium*), which are popular nectar sources for many butterflies and other insects. Relative to most other nymphalid butterflies, however, Baltimores are unusually unwary and easy to photograph and capture, even by hand. This unwariness is probably linked to the chemical defence derived from Turtlehead plants, as well as the insect's warning coloration, as noted by Bowers.<sup>1</sup>

Turtlehead plants furnish the caterpillars with chemicals known as iridoid glycosides, in particular catalpol, which provide them and eventually the adult butterflies with protection against predators.<sup>1,6</sup> Caterpillars reared on Turtlehead are unpalatable and emetic to birds, but if, as probably happens in Manitoba, they feed on alternate food plants during later stages of development after overwintering, this effect is lost.<sup>1</sup>

Despite the general impression of sluggishness, it seems that Baltimores must be capable of sustained flight in

order to establish isolated colonies, given the spotty distribution of Turtlehead, especially near the range limits of both species. Indeed, Brussard and Vawter found a high level of genetic variability within small colonies of Baltimores, which was best explained by some level of gene flow between colonies.<sup>2</sup> Belying their sluggish nature, two of the three Baltimores seen south of East Braintree on 12 July 2009 engaged in a vigorous, towering chase flight up to treetop height, recalling the pugnacious behaviour of Red Admirals and some other nymphalid species.

### Discussion

The records reported here indicate that Baltimores are more widespread in Manitoba than was previously known, though still restricted to the southeastern portion of the province. Repeat sightings of several individuals at the same localities near Wampum and East Braintree, after intervals of many years, are particularly important because they could indicate the presence of persistent colonies, rather than occasional immigrants. Nevertheless, numbers appear to be low, and we do not recommend any change of provincial conservation status; the Baltimore is one of ten butterfly species considered "possibly at risk" in Manitoba.<sup>3</sup>

It is possible that the Baltimore is undergoing a range expansion linked to climate change; therefore, future observations beyond the limits of these records should be anticipated.<sup>10,11</sup> In particular, Whiteshell Provincial Park has received attention from several lepidopterists since the 1950s, and the 2001 records at three localities are therefore suggestive of range expansion.<sup>4</sup> Given the new records (earliest, 20 June; latest, 30 July), the flight period in Manitoba probably extends from late June to late July with considerable year-to-year



variations. The earliest records are from the most southerly locations, with the late July records being from sites almost 100 km farther to the north. Warmer temperatures at the southerly Wampum Provincial Forest sites could cause earlier adult emergence in comparison to the more northerly sites. Careful timing is therefore vital for a successful search.

The overall Baltimore distribution in Manitoba corresponds closely to that of the Turtlehead. Based on herbarium records at The Manitoba Museum, Turtleheads occur mostly in forested regions south of the Trans-Canada Highway and well east of the Red River valley. We are aware of a few additional sight records, northward to Seven Sisters Falls (50° 7' N, 96° 1' W). It is possible that range expansion of the Baltimore is facilitated to some degree by the linear distribution of Turtlehead along some roadsides, notably along PR 308. Turtlehead was not noted at the Wampum and Whiteshell sites, but vegetation was only inventoried directly along the survey transects.

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*Birth, life, and death -- each took place on the hidden side of a leaf.*

*-Toni Morrison*



## PREVALENCE AND INTENSITY OF ENDOPARASITIC NEMATODE INFESTATIONS IN ADULT AND JUVENILE SHARP-SHINNED HAWKS

ROBERT GOSSELIN, Department of Biology, University of Regina, Regina, SK, S4S 0A2; E-mail: <Rob.gosselin@hotmail.com>

### Introduction

Few studies have examined the incidence of intestinal parasites in birds of prey.<sup>1</sup> Raptor endoparasites do not usually cause disease in healthy individuals, although during times of stress they can sometimes lead to serious health problems.<sup>12</sup> The main purpose of this study was to compare the prevalence and intensity of endoparasitic infestations in juvenile and adult Sharp-shinned Hawks (hereafter SSHA) collected in Saskatchewan and Manitoba. SSHA are widespread in the boreal coniferous forests of the central Canadian provinces and migrate south to winter in the southern USA, Mexico, and Central America.<sup>2</sup> Over 90% of SSHA diet consists of small birds, but small mammals and insects also appear in their diet.<sup>2</sup>

### Methods

I examined 18 frozen SSHA carcasses obtained opportunistically by the Royal Saskatchewan Museum. I dissected out complete digestive tracts and examined them visually to detect parasite infestations (Fig. 1, see inside back cover, top). The majority of specimens were collected in rural Saskatchewan during the years 1985 to 1997, ranging from La Ronge to Consul, with one specimen from Manitoba (Table 1). Each bird was classified as juvenile or adult based on

plumage characteristics.<sup>2</sup> I sexed each specimen through examination of gonads and measurements of wing-chord, tail-length, and tarsus.<sup>10</sup> I weighed all birds to the nearest gram and scored the amount of fat in the furculum. Following Ferrer *et al.*, I removed the digestive tract and preserved it in 95% isopropyl alcohol.<sup>4</sup> The esophagus, stomach, proventriculus, gizzard, and intestine were dissected, and their digestive contents, as well as mucosal surfaces, were examined under a dissecting microscope.

The prevalence and mean intensity of parasite infestation in the gut was quantified and compared between adult and juvenile birds. This follows the terminology of Margolis *et al.*, where prevalence is the percentage of infested birds and mean intensity is the average number of parasites found within infested birds.<sup>8</sup> Statistical analyses were performed using an unpaired *t*-test.

### Results & Discussion

#### *Prevalence and mean intensity of parasitic infestation*

Eighty-nine percent of adults were infested with parasites, whereas only 11% of juveniles were infested ( $t = 4.9$ ,  $df = 16$ ,  $p < 0.05$ ; Table 2). This finding may reflect the fact that adults would have had a longer period of time to acquire



Table 1. Sharp-shinned Hawk specimen information with location and date of collection according to bird accession numbers assigned by the Royal Saskatchewan Museum. J: juvenile, A: adult, M: male, F: female.

Bird Accession#	Year of Collection	Location	Date	Age	Sex
14345	1985	Indian Head, SK	13 May	J	M
15118	1985	Birch Hills, SK	Unknown	A	F
15118.10	1985	Birch Hills, SK	Unknown	J	M
15502.006	1988	La Ronge airport, SK	16 August	J	F
15542.02	1989	Assiniboia, SK	June	A	F
15753	1989	Kronau, SK	4 September	J	F
15751	1989	Consul, SK	23 September	J	F
16165	1990	Wadena, SK	16 October	J	F
17086.79	1993	Paynton, SK	Unknown	A	M
17133.19	1994	Regina, SK	9 October	A	F
17682.3	1995	La Rivière, MB	1 May	A	M
17121.27	1995	Yorkton/Melville area, SK	12 May	A	F
17710	1997	On farm X/E 18-22-21-W2, SK	3 October	J	F
Unknown	2009	Near Porcupine Plain, SK	23 April	A	F
17701.10	Unknown	Boundary Dam, SK	Unknown	J	M
17086.80	Unknown	Unknown	Unknown	J	F
17729.3	Unknown	Unknown	Unknown	A	F
15502.05	Unknown	Unknown	Unknown	A	F

parasites from their diet than juveniles. Once acquired, endoparasites typically remain in the gut where they are able to grow and reproduce.

The mean intensity of parasites was one per juvenile and three per adult (Table 2). One adult bird had seven parasites,

which was the greatest infestation observed. Kinsella *et al.* examined five SSHA for the prevalence and mean intensity of endoparasitic infestations and found both nematodes and trematodes infecting the gut, with the majority of parasites being trematodes.<sup>7</sup> For nematodes and trematodes, respectively,

Table 2. Prevalence and mean intensity of nematode infestation in the gut between juvenile and adult Sharp-shinned Hawks (SSHA).

SSHA Host	No. Examined	Prevalence		Intensity	
		No. Infested	%	Mean	Range
Juvenile	9	1	11	1	1
Adult	9	8	89	3	1-7



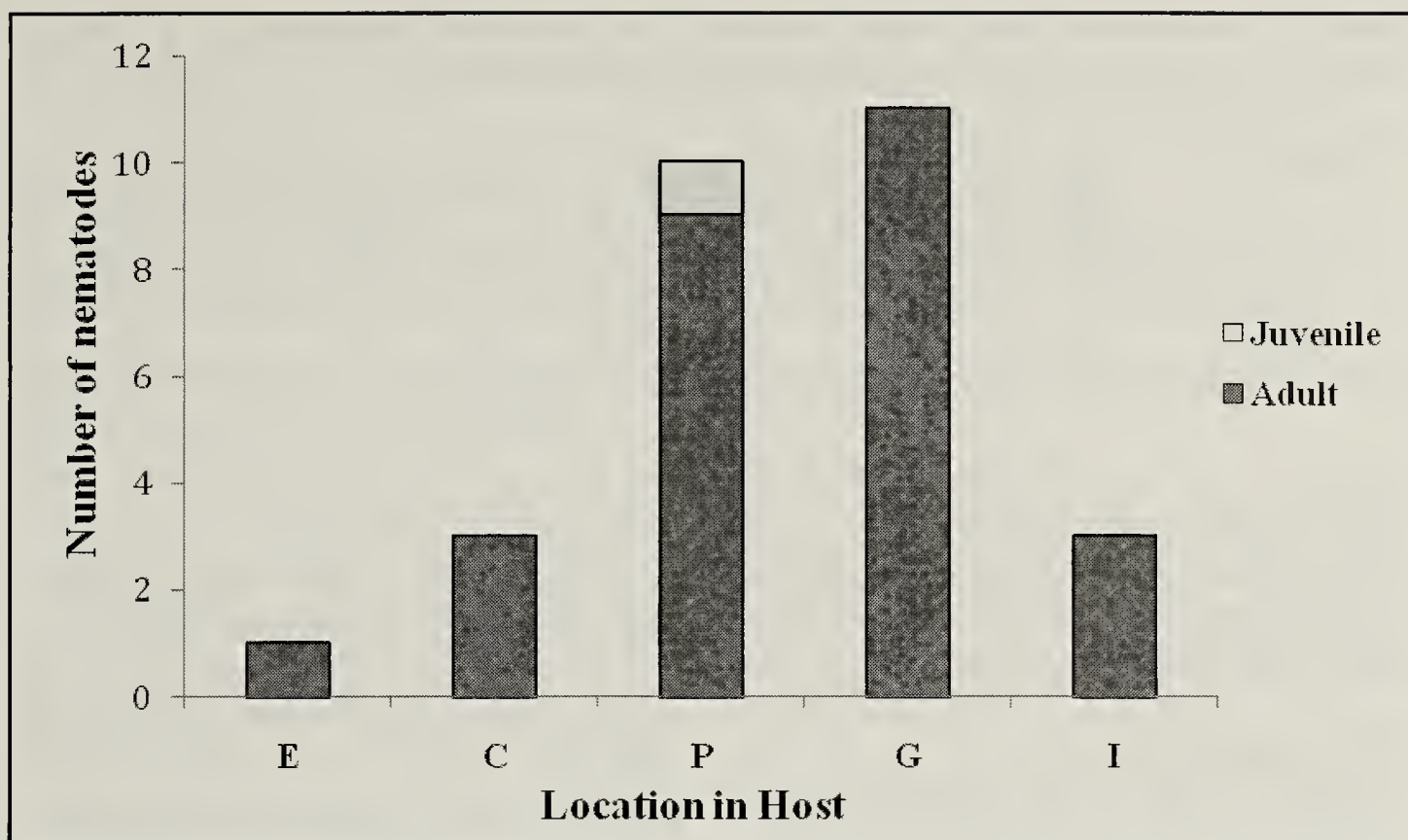


Figure 2. Number and location of nematodes found in juvenile and adult Sharp-shinned Hawks. E: esophagus, C: crop, P: proventriculus, G: gizzard, I: intestine.

the greatest mean intensity they found was three and 93 per bird and the greatest infestation was three and 291 per bird. Despite such high mean intensities of trematodes, Kinsella *et al.* did not observe any significant lesions nor implicate endoparasitic infestations as the cause of death in any of their specimens.<sup>7</sup>

#### *Location and severity of parasite infestation*

In total, I found 28 parasites among the nine adult and nine juvenile birds, all of them nematodes. Twenty-seven were found in adult birds, whereas only one was found in the juveniles. The majority of nematodes found were infesting the proventriculus or the gizzard (Fig. 2).

Smith stated that nematodes represent the largest group of endoparasites that infect birds of prey and that they are the most potentially pathogenic of the common raptorial parasites.<sup>12</sup> However, most parasitic infections cause little or no stress to healthy individuals. Parasitic infections can cause health problems if

raptors are stressed by injury or illness.

#### *Other factors that contribute to parasitic infestations*

Poulin analyzed the differential growth rates of helminths between male and female birds and found a small but consistent male bias in parasitic infections such that male hosts had greater prevalence of parasitic infestations than females.<sup>9</sup> Sex-related differences in parasite infestations may be due to males and females differing with respect to their immune system,<sup>5,6</sup> or due to different behaviours between males and females in territoriality, movement patterns, social interactions, and diet.<sup>9</sup>

I found no significant difference in the prevalence and mean intensity of parasitic infestations between males and females ( $t = 0.50$ ,  $df = 16$ ,  $p > 0.05$ ; Table 3); however, my sample sizes were small, limiting statistical power. Most studies that have documented parasitic infestations among birds of prey did not specify the sex of their specimens.<sup>1,7,11</sup>



Table 3. Prevalence and mean intensity of nematode infestation in the gut between male and female Sharp-shinned Hawks (SSHA).

SSHA Host	No. Examined	Prevalence		Intensity	
		No. Infested	%	Mean	Range
Male	5	3	60	2	1-4
Female	13	6	46	4	1-7

Doing so would allow researchers to explore sex-specific differences in levels of parasitism. This is important because a bias in favour of one sex could have a range of evolutionary implications.<sup>3</sup>

Acknowledgements

I thank Dr. Stephen Davis for providing the opportunity to conduct this project and for his help with dissections. I also thank Dr. Glenn Sutter of the Royal Saskatchewan Museum for allowing the use of frozen SSHA specimens and Peta White and John MacDonald from the University of Regina for providing lab space and dissecting equipment.

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The world is always in movement.

- V. S. Naipaul



# HUMAN INTERACTIONS

## ROAD MORTALITY SURVEY IN SOUTHWESTERN SASKATCHEWAN

ASHLEY N. FORTNEY, Department of Biology, University of Regina, Regina, SK, S4S 0A2; E-mail: <fortneya@uregina.ca>

Roads can cause major changes to ecosystems with negative consequences for wildlife and biodiversity,<sup>1,4,12</sup> and have been implicated as factors in the decline of animal populations in many areas.<sup>3,9,11</sup> Roads cause habitat loss and fragmentation, present barriers to animal dispersal, and can affect population dynamics and genetics by causing spatial isolation of breeding groups.<sup>2,6,10</sup> Roads affect the ecology of approximately 20% of the United States; this number is likely less in Canada, but is on the rise.<sup>8</sup>

In addition to landscape effects, roads cause direct mortality of individuals via vehicle-animal collisions. It is estimated that 1 million vertebrates are killed every day on roads in the United States, and at some point during the last three decades of the 20<sup>th</sup> century, vehicles on roads most likely surpassed hunting as the primary cause of direct vertebrate mortality by humans on land.<sup>7</sup> My objective for this study was to document road mortalities of wildlife in the area within and immediately surrounding Grasslands National Park in southwestern Saskatchewan (Fig. 1). This survey was part of a larger project focused on road mortality of snakes, which are not considered here.

### Methods

Systematic surveys were conducted on the road system surrounding Val Marie, Saskatchewan (49° 14' N, 107° 43' W; Fig. 1). Specific study sites included the west block of Grasslands National

Park (GNP), which is a protected area of native mixed-grass prairie, and the Val Marie Prairie Farm Rehabilitation Administration (PFRA) pasture, which is also federally managed. The major landscape feature of the study site is the Frenchman River Valley. Paved roads run adjacent to these areas connecting them to each other and the town of Val Marie. Both regions are bounded by ranches and other agricultural areas, as well as gravel and paved roads, which are mainly used

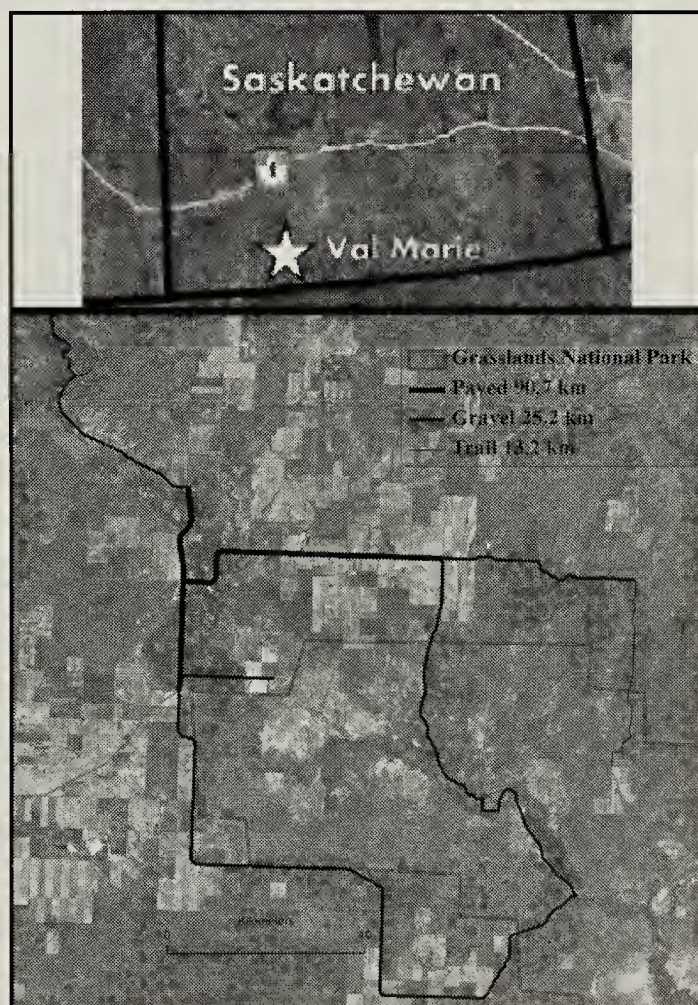


Figure 1. Study site: Val Marie, SK (top), and surrounding area (bottom). Road types and respective kilometres driven during road surveys are indicated.



by local landowners, park employees, and tourists. Not many roads pass directly through GNP or PFRA land, and those that do are either gravel roads or trails. Traffic volumes on these roads tend to be low, but road mortality of animals is still observed.

Surveys were carried out from 6 May to 21 August 2009. Roads were chosen to cover a wide range of contexts, such as varying distances from the Frenchman River Valley, as well as to encompass a large area of GNP and PFRA land. An assortment of road types and adjacent habitats were also considered. All roads chosen were driven once every 2 days. Total kilometres traveled during each survey were: 25.2 km (19.2%) paved roads, 90.7 km (68.9%) gravel roads,



*Figure 2. Road-killed juvenile American Badger that was hit by a vehicle on Highway #4 near Val Marie, SK.*

*Ashley Fortney*

and 15.7 km (11.9%) of trails (Fig. 1). Appropriate driving speed was determined based on the ability to visually detect an animal on the road, and differed based on the road type and distance of visibility.

When a dead animal was encountered, global positioning system (GPS) coordinates were recorded, and the animal was removed from the road so that it would not be counted again on subsequent surveys. Select animals were deposited in the collection of the Royal Saskatchewan Museum.

## Results and Discussion

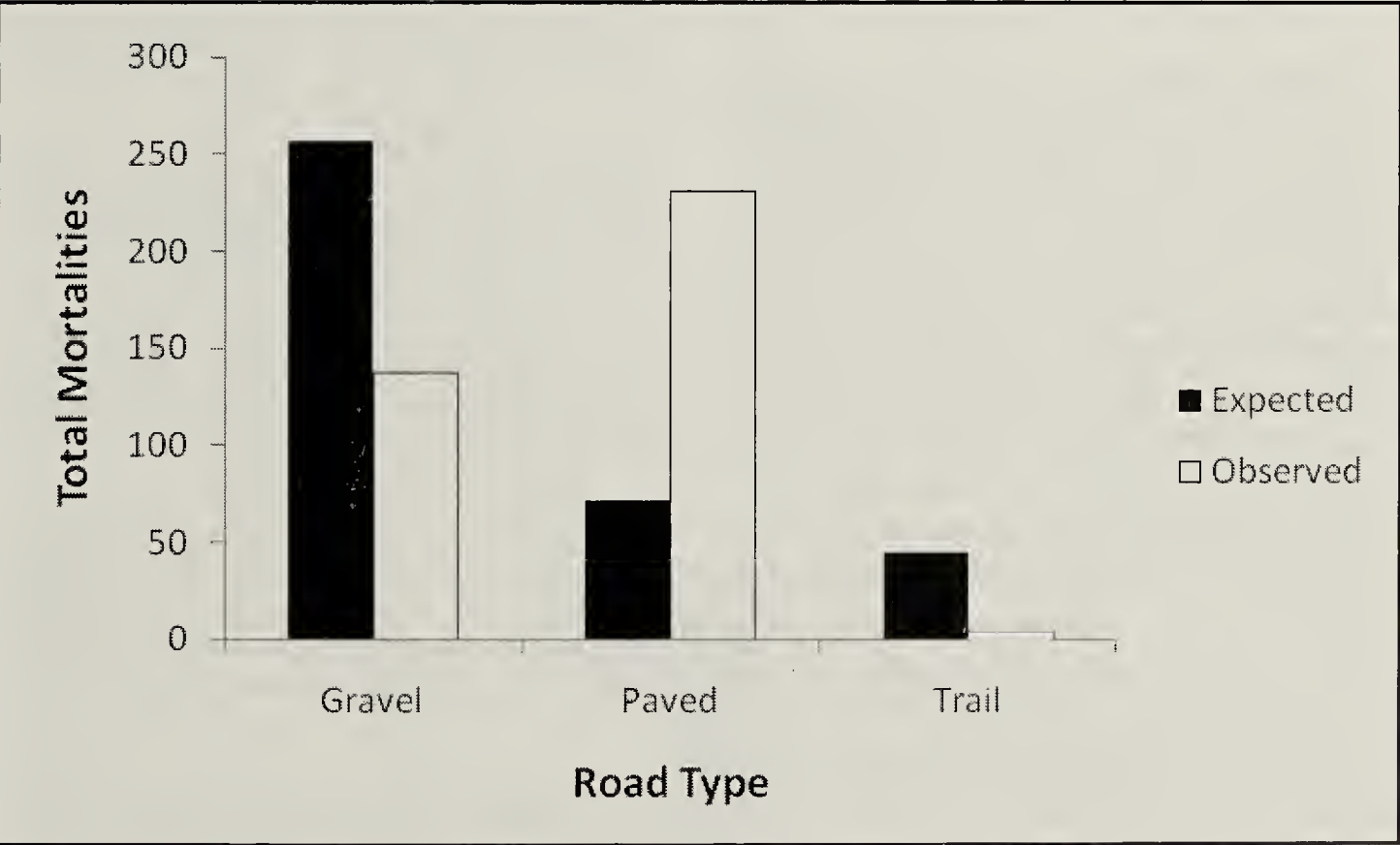
I identified 25 species of road-killed animals during surveys: 1 amphibian, 8 mammals, and 16 birds (Table 1). Five bird specimens were unidentifiable due to their body condition but were most likely Vesper, Savannah, or Baird's Sparrows. Of 372 individual animals found, 0.3% were amphibians, 14.2% were birds, and 85.5% were mammals. The most abundant species found were Richardson's Ground Squirrels, which comprised 82.0% (305) of all individuals found. Figure 2 shows a road-killed American badger found on Highway #4, a few kilometres south of Val Marie.

The only road-killed amphibian I found during surveys (a Northern Leopard Frog) is listed by the Committee on the Status of Endangered Wildlife in Canada as a species of special concern.<sup>5</sup> Fragmentation, along with increased isolation of populations, has led to the decline and reduced recovery of prairie populations of the Northern Leopard Frog.<sup>5</sup> I also found dead individuals of three threatened bird species, comprising 15.1% of all road-killed birds: Chestnut-collared Longspur, Common Nighthawk, and Loggerhead Shrike.<sup>5</sup> Habitat fragmentation due to road construction has been indicated as a factor contributing to the threatened



**Table 1. Number of individuals of each species found dead on roads in and around Grasslands National Park and the Val Marie PFRA pasture in southwest Saskatchewan during the summer of 2009.**

Amphibians	Birds	Mammals
Northern Leopard Frog 1	Baird's Sparrow 2	American Badger 1
	Brewer's Blackbird 1	Coyote 2
	Chestnut-collared Longspur 4	Deer Mouse 1
	Common Nighthawk 3	House Cat 1
	Eastern Kingbird 3	Richardson's Ground Squirrel 305
	Horned Lark 12	Striped Skunk 1
	Killdeer 2	White-tailed Deer 2
	Loggerhead Shrike 1	White-tailed Jack Rabbit 5
	Meadowlark 7	
	Mourning Dove 4	
	Ring-necked Pheasant 1	
	Sandpiper 1	
	Sharp-tailed Grouse 1	
	Sparrow Species 5	
	Swainson's Hawk 3	
	Tree Swallow 2	
	Vesper Sparrow 1	
1	53	318



*Figure 3. Expected and observed road mortalities for each road type surveyed (gravel, paved, and trail). Expected values are based on kilometres driven on each road type. Road mortalities were observed significantly more on paved roads than on gravel roads or trails (chi-squared test,  $\chi^2 = 450.470$ ,  $df = 2$ ,  $p < 0.0001$ ).*

status of the Chestnut-collared Longspur.<sup>5</sup> In my study area, the significance of road mortality from a conservation perspective is unknown but deserves more attention to assess the degree of its affect on local wildlife.

I found a significantly higher number of road mortalities on paved roads (Highways #4 and #18) than on gravel roads or trails (chi-squared test,  $\chi^2 = 450.470$ ,  $df = 2$ ,  $p < 0.0001$ ; Fig. 3). Paved roads are hotspots for road mortality most likely due to increased traffic density and vehicle speed. Road mortality should be considered when construction of new roads is taking place, especially in areas with species of conservation concern. For ground-dwelling animals, diversion fencing, culverts, and underpasses are effective mitigation strategies. For all species, lower vehicle speed is important in reducing the risk of animals to road mortality. Driver awareness could be extremely beneficial to reduce road mortality in high risk areas.

Documentation of road mortality is important to increase knowledge of when and where road mortality occurs and what species are at risk. Results from road surveys are essential in management strategies aimed at mitigation of road mortality of animals. Learning about how different species are affected by roads, from the behaviour of individuals to the effect they have at the population and community levels, and incorporating this knowledge in planning, will considerably decrease the negative environmental effects that are caused by roads. GNP is a relatively new protected area, and we are just beginning to learn about the importance of road mortality for the animals protected by the park.

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POSSIBLE BREEDING NORTHERN PARULAS IN CENTRAL WESTERN MANITOBA

The Northern Parula is an eastern North American wood-warbler that approaches its northwestern range limit in southeastern Manitoba (Fig. 1). Detection of this species in the breeding season is facilitated by its distinctive buzzy songs and its preference for nesting in conspicuous arboreal lichens of the genus *Usnea*.<sup>6</sup> It is locally quite common in Whiteshell and Nopiming Provincial Parks (PP), east and southeast of the south basin of Lake Winnipeg, and also occurs on the west shore of Lake Winnipeg in and near Hecla/Grindstone PP.<sup>4,6,9</sup> This note documents observations of possible breeding farther north and

west. Records are described in the order of the five numbered sites mapped in Fig. 1.

Observations

*Site 1*—On 13 June 1998, a visiting birder from California found a singing Northern Parula along Hwy 60, 36.2 km west of Hwy 6 and 13 km west of the Kaweenakumik (formerly Kawinaw) Lake access road (B. Siegel, pers. comm.). She noted that much *Usnea* lichen was present, and the bird appeared to be looking for a nest site. I have made numerous stops in this general area between 1991 and 2009, specifically

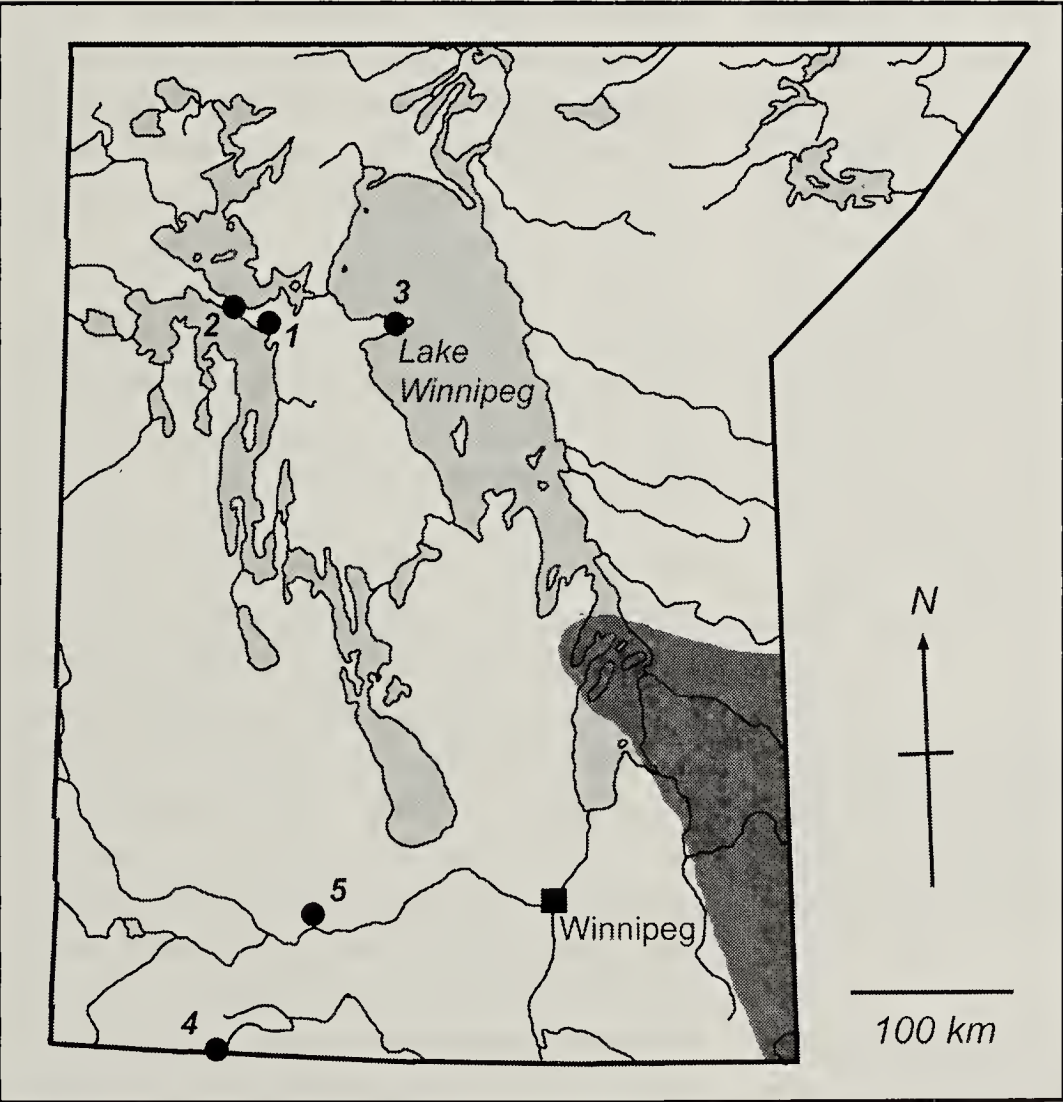


Figure 1. Southern Manitoba, showing the known breeding range of Northern Parulas (based on References 6 and 9) and the localities discussed in the text.





Figure 2. Possible breeding habitat for Northern Parulas north of Lake Winnipegosis, MB (Site 2). The inset shows detail of arboreal lichens (presumed *Usnea*).

Peter Taylor

listening for Parulas at sites with plentiful *Usnea*, without success.

*Site 2*—On 28 June 2007, I heard a singing male at an ideal-looking stand of mixed-wood forest, with abundant *Usnea* on dead and dying conifers (Fig. 2), alongside Hwy 60 north of Lake Winnipegosis, about 50 km west of Hwy 6 ( $52^{\circ} 58.26' \text{ N}$ ,  $99^{\circ} 53.28' \text{ W}$ ). Two were singing about 150 m apart at the same site on 23 June 2008, but none was heard under good conditions, with many other warblers singing, on 12 and 14 June 2009.

*Site 3*—On 25 June 2008, the distinctive song of a Northern Parula was heard near the east end of the Long Point road (R. Mooi, Curator of Zoology at The Manitoba Museum, pers. comm.).

*Site 4*—On 26 June 1981, three Northern Parulas were reported singing at the International Peace Gardens, at the

Manitoba–North Dakota border in the Turtle Mountain region (D. Dupre, pers. comm.); one was heard there the following day by two birders then resident in Winnipeg (W. Neily, J. Zoch, pers. comm.).<sup>6</sup>

*Site 5*—On 24 June 2000, a singing male was observed along the Epinette Trail in Spruce Woods PP, south of Carberry (L. Blanchette, pers. comm.).

## Discussion

The observations at Sites 1 to 3 suggest that Northern Parulas may breed, sparsely and irregularly, in suitable habitat near  $53^{\circ} \text{ N}$  in central western Manitoba. While nesting was not confirmed, the records meet the criteria for “possible breeding” used in bird atlases.<sup>e.g. 5,8</sup> The International Peace Gardens and Spruce Woods records are more difficult to categorize, but perhaps they represent non-breeding summer visitors as opposed to possible breeders.



A similar distinction was made by Smith in assessing summer records of Northern Parulas in Saskatchewan.<sup>8</sup> It should be noted, however, that Northern Parulas have bred occasionally as far from their normal range as coastal California.<sup>1,7</sup>

Two other extralimital summer records are unlikely to represent breeding localities. A mid-June 1987 sighting by several observers at Churchill (about 500 km north of the region mapped in Fig. 1) was probably well north of potential breeding habitat.<sup>2</sup> Two Northern Parulas, one of them singing, were found on 8 July 2009 in Winnipeg, where the species is a rare migrant.<sup>3</sup> Koes thought them most likely to be failed breeders that had wandered from their normal range.<sup>3</sup>

In combination with possible breeding records in Saskatchewan, and north of the main breeding range in Ontario, the observations at Sites 1 to 3 suggest that breeding may occur, albeit sparsely, in parts of the boreal forest well beyond the commonly published range limits.<sup>5,8</sup> The main breeding range in Ontario lies across the Precambrian Shield and is contiguous with the Manitoba range (Fig. 1), but there are scattered records of singing males northward to the Hudson Bay lowlands.<sup>5</sup> Of 24 records mapped in the *Atlas of Saskatchewan Birds*, four were classed as possible breeding; these involved singing males in summer in the southern boreal region, at Hanson Lake Road, Emma Lake, Red Earth, and Duck Mountain, all in the eastern half of the province.<sup>8</sup> As noted above, several other Saskatchewan records were classified as summer visitants.<sup>8</sup>

The strong association with *Usnea* lichen may tend to concentrate migrant Northern Parulas that have overshot their normal breeding range in spring, and improve their chances of extralimital breeding, as well as highlighting promising

habitat for passing birders. Perhaps the *Manitoba Breeding Bird Atlas*, a 5-year project that was initiated in spring of 2010, will yield a clearer picture of the Northern Parula's status in inaccessible, forested regions of central and western Manitoba. Further information on this project is available at <http://birdatlas.mb.ca> or from Christian Artuso, Box 24 – 200 Saulteaux Crescent, Winnipeg, MB, R3J 3W3.

## Acknowledgements

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- Peter Taylor, P.O. Box 597, Pinawa, MB, R0E 1L0; E-mail: <[taylorp@granite.mb.ca](mailto:taylorp@granite.mb.ca)>



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# PHOTO NOTES

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## SANDHILL CRANES

On 24 June 2009, I noticed two Sandhill Cranes grazing in our wheat field so I went out and got very close to what I assume was their nesting site. I took a couple of quick pictures then left them alone. As July progressed, we occasionally saw the cranes out feeding, but always from a distance.

On 29 July around 08:00 h, my son-in-law was driving west of our farm in his (very noisy) one-ton Dodge diesel truck. He noticed a crane chick and two adults in the road ditch. As he attempted to drive past them, one adult crane flew up onto the road and stood in front of his truck. Knowing his mother-in-law (i.e, me) fairly well, he immediately phoned me to bring my camera. I arrived within 2 minutes and couldn't believe my eyes. The crane was acting like a Killdeer, attempting to draw us away from the chick. Meanwhile, the other adult disappeared into the wheat

field with the chick. That adult later reappeared and flew toward a nearby slough. The crane on the road did some more moves: one minute it pretended to be injured and the next minute it made itself as threatening as possible. When it felt that the other adult was in the clear, it then flew toward the slough and rejoined its mate. After this incident we regularly saw all three of them out in our pea field grazing. One day as we drove by, the chick hid behind a large weed in the field, plainly visible, but I guess it felt safer.

I am pleased to report that at the end of April 2010, we noticed two adult Sandhill Cranes grazing in the same location as I had seen them in 2009, so hopefully they will have a successful year again.

- Sharon Walker; E-mail: <sharon.walker@sasktel.net>





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## BIRDS OF NORTH AMERICA

FRANÇOIS VUILLEUMIER (EDITOR-IN-CHIEF). 2009. Dorling Kindersley, New York, New York. Hardcover: ISBN: 978-1-55363-103-3. 744 pages, 23.5 × 15.9 cm, \$55.00 CDN.

*Birds of North America* incorporates aspects of bird identification, life history features, and behaviour in a comprehensive and attractive reference volume. In contrast, most other bird guides either focus on identification or behaviour, but not both. *Birds of North America* contains full-page accounts for 654 bird species common to the continent, quarter-page entries for 68 rare species, and very brief descriptions of about 155 vagrant species. This book covers the continental USA and Canada, as well as adjacent coastal waters.

Inside the book, the species entries are ordered by conventional classification. Before your first use of the book, I recommend reading the section entitled 'How This Book Works' in the Introduction. It expertly explains each portion of the species accounts in all sections of the book. Each bird family section in the species guide begins with a useful and colourful page introducing typical species in the family and their habitats.

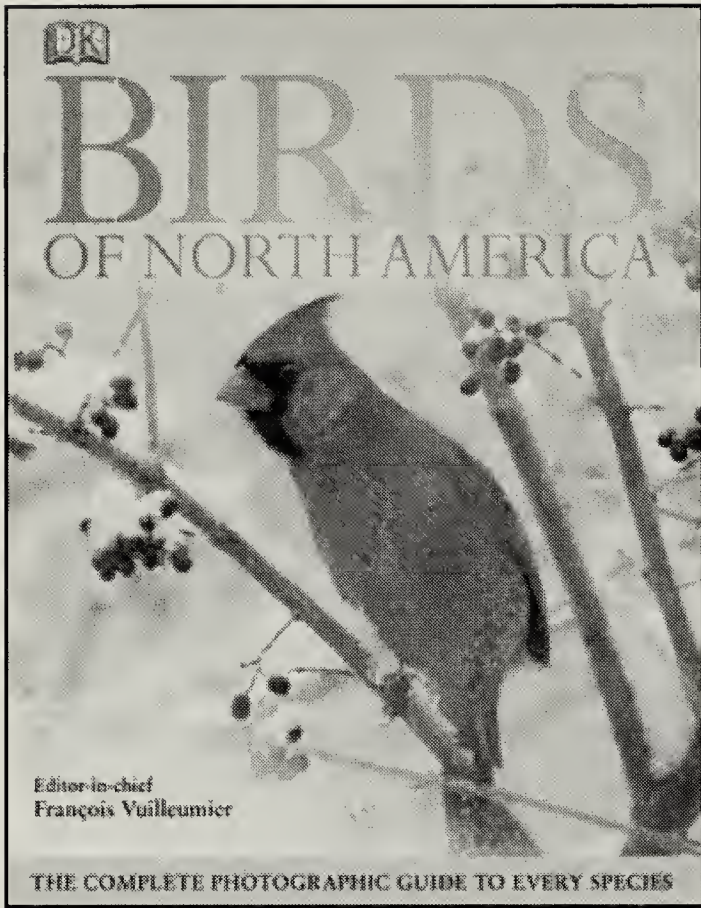
The accounts for common North American bird species are attractively arranged and full of useful and interesting natural history information. I particularly like the large primary and smaller secondary photos and bird-in-flight illustrations, each with helpful key identifying features clearly marked. These photos illustrate species in different views and plumage variations, including subspecies, sex, adult/juvenile, and seasonal. All photos, illustrations, and

range maps are clear and sharp. The natural history characteristics of each species are neatly summarized in the text or in the bottom panel of the page. You can quickly learn the voice, nesting habits, feeding habits, range, flight patterns, occurrence, social system, wingspan, size, lifespan, mass, and conservation status for each species. These accounts also contain an additional photo that reveals typical habitat or behaviour. The natural history information presented here is accurate and up-to-date. Each species account has a very useful insert box containing one to three similar species, highlighting their differences. These boxes also state on what page in the book you can quickly find accounts of similar species.

The rare species accounts contain one excellent photo each with diagnostic features pointed out, common and scientific species and family names, a brief description of the species, and information about occurrence in North America, voice, and size. Vagrant species entries simply list common and scientific species names, bird family common and scientific names, and brief descriptions of occurrence in North America and where they come from.

The Introduction also includes two-page summaries of the following topics: avian evolution, anatomy and flight, bird migration, courtship and mating, nest and eggs, and bird identification. These summaries are strongly supported by





relevant and attractive colour photos and illustrations. The bird identification article was particularly insightful about the key identification features. An article on North American bird habitats would perhaps have been useful here, but was not included in this volume.

The Table of Contents is very reader friendly, with the species guide portion divided by the common name of bird families. The book concludes with an excellent three-page glossary of avian terms, a very useful detailed index, and photo credit acknowledgements. Unfortunately, no bibliography or further reading section was included in the volume, which is unfortunate for those

readers who may want to learn more about the topics discussed.

A major reference guide that may be considered similar is the *Sibley Guide to Birds*.<sup>1</sup> The *Sibley Guide* has smaller pages and exclusively uses the author's reprinted paintings to illustrate the birds. Sibley's guide does show more variations (adult/juvenile, gender, seasonal, regional) of bird species than *Birds of North America*. However, in my opinion, *Birds of North America* is superior because of the larger illustrations, greater emphasis on natural history of bird species, and a more attractive and reader-friendly layout.

The publisher pitches *Birds of North America* as a bird guide, but it is too large and heavy for regular use in the field. Instead, it is more of a reference book that strongly complements existing bird field guides. It has a sturdy hard cover binding that should last for a long time. Aside from a few minor deficiencies, this is a very useful and beautiful volume. I highly recommend this book to anyone who is a keen birder or who wants to learn more about the birds of North America.

1. SIBLEY, DAVID A. 2000. *The Sibley Guide to Birds*. Alfred A. Knopf, New York, New York.

- Reviewed by Rob Warnock. E-mail: <[warnockr@accesscomm.ca](mailto:warnockr@accesscomm.ca)>



*The day I see a leaf is a marvel of a day.*

*-Kenneth Patton*



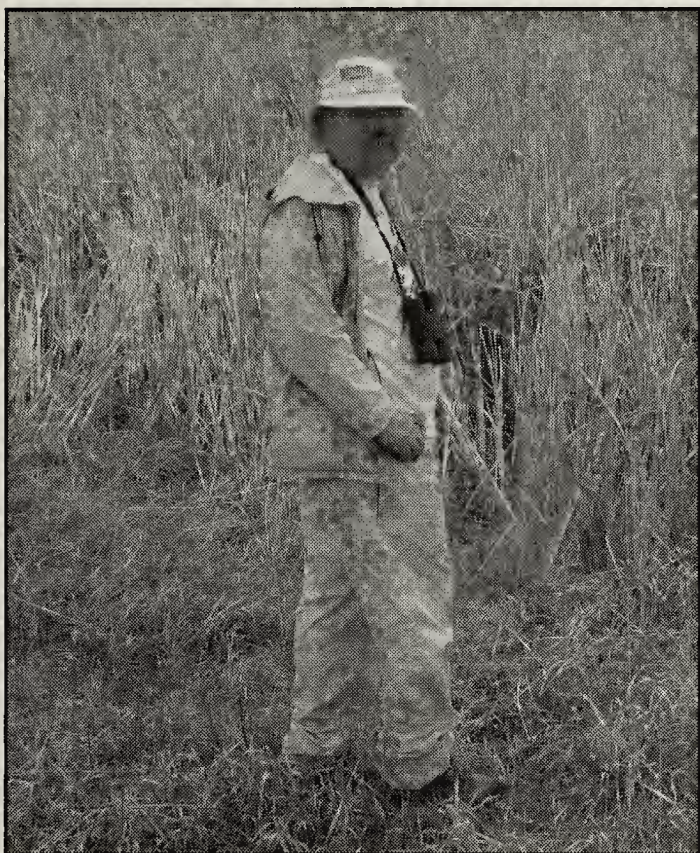
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# IN MEMORIAM

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## IN MEMORIAM: DAVID CHASKAVICH 1953–2010

DON WEIDL, 436-2nd St. E., Saskatoon, SK, S7H 1P1



*David Chaskavich at one of his favourite birding spots at East Ekapo Lake, SK, May 2008.*

David J. Chaskavich was born on 23 March 1953 in Broadview, Saskatchewan, and passed away in Regina after a long battle with cancer. At 13 years old, it was very evident that David's passion for nature would last a lifetime. Influenced by Jack Lane and Lorne Scott, David started building bluebird houses even before he had a driver's licence and put them up in the Broadview area as an arm of the Manitoba/Saskatchewan Bluebird Trail. At one time, David was looking after 250 bluebird houses and successfully had Eastern Bluebirds nesting in several of them. Over the next 40 years, many of the landowners in the Broadview area would

often comment on how nice it was to see bluebirds and Tree Swallows nesting on their land.

After attending college in Vermillion, Alberta, from 1975 to 1977, and later cooking school, David settled back in Broadview, where he became a cook at the Broadview seniors' home. Over the next 25 years, David's yard in Broadview became a birder's paradise. Not only was David a good birder, he was also an excellent gardener – his yard was full of trees, shrubs, and flowers, which attracted a number of bird species. Some of David's "firsts" for the Broadview area included Orchard Oriole, Black-headed Grosbeak, and House Finch.

From 1968 to the mid-1980's, David accompanied Manley Callin and a host of other birders including Frank Brazier, Elmer Callin, Johnny Nelson, and Don Weidl on an annual 2-day bird survey in the Broadview area. Day 1 included coverage of the Crooked/Round Lake areas north of Broadview, while Day 2 included the Ekapo Lake area south of Broadview. During these surveys and trips to Fort Qu'Appelle to visit Manley, David's birding skills excelled. David contributed many species accounts to Manley Callin's *Birds of the Qu'Appelle, 1857-1979*, which was published in 1980. Some of David's contributions included Yellow-crowned Night Heron and Northern Parula. On 18 May 2008, David, Carman Dodge, and Don Weidl conducted a 40th anniversary bird



count in honour of Manley's trips to the Broadview area.\*

David was a long-time member of Nature Saskatchewan and attended many of the fall and spring meets across Saskatchewan. Like many members, David quietly did his part for the environment. In 1999, David moved to an acreage north of Wolseley where he started to create another birder's paradise. With his wife, Lorrie, he planted over 3000 shrubs and trees and slowly educated his neighbours on the values of wildlife and nature. He conducted annual Christmas Bird Counts in the Broadview area from 1966, and even though he was very ill, he completed a Christmas Bird Count on 26 December 2009.

David said he was born 150 years too late, as he often dreamed of being a pioneer on the prairies and seeing the herds of bison and flocks of passenger pigeons. In his own way, David was a pioneer and had a big influence on people in the Broadview and Wolseley areas with regards to the environment and conservation. Lorrie, his daughter Stephanie, and his granddaughter Anika continue to plant trees on the acreage. David will be missed by his friends and family.

**\*EDITORS' NOTE:** see Don Weidl's article "40th anniversary of the Manley Callin Ekapo Lake Bird Outing", *Blue Jay* 67:106-108, for more on this anniversary bird count.

## IN MEMORIAM: MARY GILLILAND 1940–2010

C. STUART HOUSTON, 863 University Drive, Saskatoon, SK, S7N 0J8; E-mail: <stuart.houston @usask.ca>



*Portrait of Mary Gilliland taken in 1984.  
Photo courtesy of Sean Gilliland.*

On 19 April 2010, Saskatchewan lost a woman originally from Wisconsin who left her mark in numerous ways. Her life was nature-centered, evident even in her e-mail address "birdwoman@...." and her licence plate, "BIRDS-1".

Mary served for 10 years on the board of the Canadian Nature Federation (CNF), the "umbrella group" for provincial and regional nature societies across Canada; for eight of these years she was Vice-President, President, and Past-President – the first Saskatchewan person to be national president. Because of Mary's work that helped achieve proclamation of the Grasslands National Park, the Saskatchewan Society received the Affiliate Award from CNF in 1990. Mary introduced the BirdQuest program to



Saskatoon. She was a member of a select group of CNF, the Mabel Whittemore Circle.

Mary was always an active member of the Saskatchewan Nature Society. She served as Director of Special Publications from 1982 until 2005, masterminding and editing with punctilious care eight special publications that received national notice during her tenure, including Frank Roy's *Birds of the Elbow* (1992), Margaret Belcher's *The Isabel Priestly Legacy: Saskatchewan Natural History Society 1949-1990* (1996), Al Smith's *Atlas of Saskatchewan Birds* (also 1996), and Anna Leighton et al.'s *Birds of the Saskatoon Area* (2002). When the Parks Act was passed in 1986, with a new category of Wilderness Parks, Mary served for 5 years on the Parks Advisory Council to the Department of Parks and Renewable Resources. Mary was Second Vice-President from 1985 to 1986, honoured with Fellowship in 1993, named Volunteer of the Year in 1996, and was Honorary President from 1998 to 2003. She prepared the SNHS brief that successfully opposed a major commercial development on a fragile shore of Redberry Lake where the endangered Piping Plover was nesting.

Locally, from 1982 through 1984, her internal time clock was put out of kilter for all of June, as she did unique studies for Dr. Bernie Gollop to test the validity and consistency of breeding bird counts. She rose at 03:00 h each morning (!) to begin 5-hour Breeding Bird Surveys near Dundurn shortly after 04:00 h, half an hour before sunrise. She was the instructor for the University Faculty Wives' birding group from 1982 through 2000 (their T-shirts were labelled "Mary's flock"), led numerous bird walks for the Saskatoon and Saskatchewan Societies, and for 20 years led the annual Ante-Grey-Cup (not

anti-Grey Cup!) bird outings in President Murray Park.

For the Saskatoon Nature Society she was Secretary (1981-82), Vice-President (1983), Field Trip Coordinator (1983-84), President (1985-86), Newsletter editor, (1987-88), Field Notes editor (1989), Conservation Director (1990-91), Director (1992), Christmas Bird Count compiler (1987-1994), and occasional Fall Bird Count compiler. She was elected an Honorary (Life) Member in 2007. She both solicited and contributed to Nature Notes in the *Saskatoon Sun* and in *Blue Jay*. She wrote a biographical sketch of her heroine, Louise de Kiriline Lawrence, the nurse who cared for the Dionne Quintuplets, and later became a world authority on forest woodpeckers. Mary served on the conservation committee of the Meewasin Valley Authority, inventoried the remaining natural areas near the city, and received their esteemed Conservation Award in 1987.

Mary Hart Deaver was born on 21 March 1940 in Richland Center, Wisconsin. She was valedictorian in her high school class and a member of the National Honor Society in 1958. She won a 4-year scholarship to attend the University of Wisconsin, where she obtained her B.A. Phi Beta Kappa in 1962, majoring in French and Russian, with a year of study in Lublin, Poland. She and fellow student Marshall Gilliland, whom she had married in 1960, then moved to Pullman, Washington, where she taught Russian and French at Washington State University and obtained her M.A. in 1967. Her thesis, concerning a French aviator and author of *The Little Prince*, was titled "Antoine de Saint-Exupéry: An Essay in Communication." After Marshall obtained his Ph.D. in American History and Literature in 1968, he and Mary moved to Saskatoon, where Marshall



was a professor of English and headed the humanities and social sciences computing laboratory at the University of Saskatchewan. Marshall took early retirement in 1996 and died of cancer in 2004.

Mary's contributions went far beyond nature and the environment. At the university she taught classes in Russian and French and took a B.Ed. degree, graduating in 1983. For 12 years she served as audiovisual coordinator and then as public information chair for UNICEF Saskatoon. She was one of two longest-serving members of the Saskatchewan Women's Calendar Collective (1982 to 2008), which published the annual Canada-wide Herstory, which featured for each week of each year a full-page biography of an important but usually forgotten woman. She was also a member of the Saskatoon Quilters Guild.

Fighting breast cancer herself for 22 years, she maintained a remarkably optimistic outlook. Mary helped organize the Hope Cancer Centre in the Saskatoon YWCA, walked in the annual Hope Cancer Run, provided individual support to cancer patients, served on the board of the Saskatchewan Cancer Agency for 6 years, and worked with social and survivors' groups involved with Breast Cancer Action Saskatchewan.

In one of the many tributes to Mary, her nominator for honorary membership, Attila Chanady, summed up her contributions to the Saskatoon Nature Society: "Mary Gilliland has made a significant contribution to the study of natural history and to the conservation and educational work of the Saskatoon Nature Society. A birder of considerable expertise, a naturalist of extensive experience, she was a committed member with years of meritorious service; she has inspired and touched the hearts and minds of many who had the good fortune of working with her, or just being in her company on field trips."

Mary is survived by her son Sean Gilliland, daughter-in-law Bernie Boehm-Gilliland, and granddaughters Alyssa, Taylor, and Emily, all in Saskatoon. A meeting to celebrate her life literally packed Holy Spirit hall on 2 May 2010. Having touched so many in such diverse ways, Mary will be missed.

### **Acknowledgements**

I thank Cheryl Avery, Attila Chanady, Jodi Joy, Sylvia Chorney, Sean Gilliland, Marina Lawson, Kathy Reid, and Bonnie Piercy for information and Frank Roy for his skilful editing.



*Those who contemplate the beauty of the earth find reserves of strength that will endure as long as life lasts.*

*- Rachel Carson*



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# MYSTERY PHOTO

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**ANSWER TO THE MARCH 2010 MYSTERY PHOTO**

Ryan Fisher found these tracks at Condie Nature Refuge (near Regina, SK). He thinks this was a hole where Gray Partridge hunkered down, and thus, the tracks are presumably those of the partridge. Thanks to Ryan for submitting this interesting photo.



**JUNE 2010 MYSTERY PHOTO**

(See outside back cover for colour picture). On 2 July 2009, while filling a bird feeder, Harvey Schmidt discovered these tiny gems suspended from a willow twig. What are they and who put them there?





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Editors: Vicky Kjoss and Chris Somers, 81 Martin St., Regina, SK S4S 3W4, Canada, Email: [kjoss@sasktel.net](mailto:kjoss@sasktel.net)

Formatting: Carla Windl, Email: [twindl@accesscomm.ca](mailto:twindl@accesscomm.ca), 306-789-7840

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Common and scientific (Latin) names are used for all species. Common bird names follow the Checklist of North American birds by the American Ornithologists' Union (7th edition, 1998); mammal names: Mammal Species of the World by Wilson & Reeder; butterfly names: The Butterflies of Canada by Layberry et al.; and names of reptiles and amphibians follow Scientific and Standard English Names of Amphibians and Reptiles of North America North of Mexico by Brian I. Crother (Committee Chair), 2001, <<http://www.ssarherps.org/pdf/Crother.pdf>>.

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Figure 1. Nematode infesting the proventriculus of an adult Sharp-shinned Hawk.  
See article by R. Gosselin on p. 91.

Robert Gosselin



Cinnamon Teal.

Randy McCulloch





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